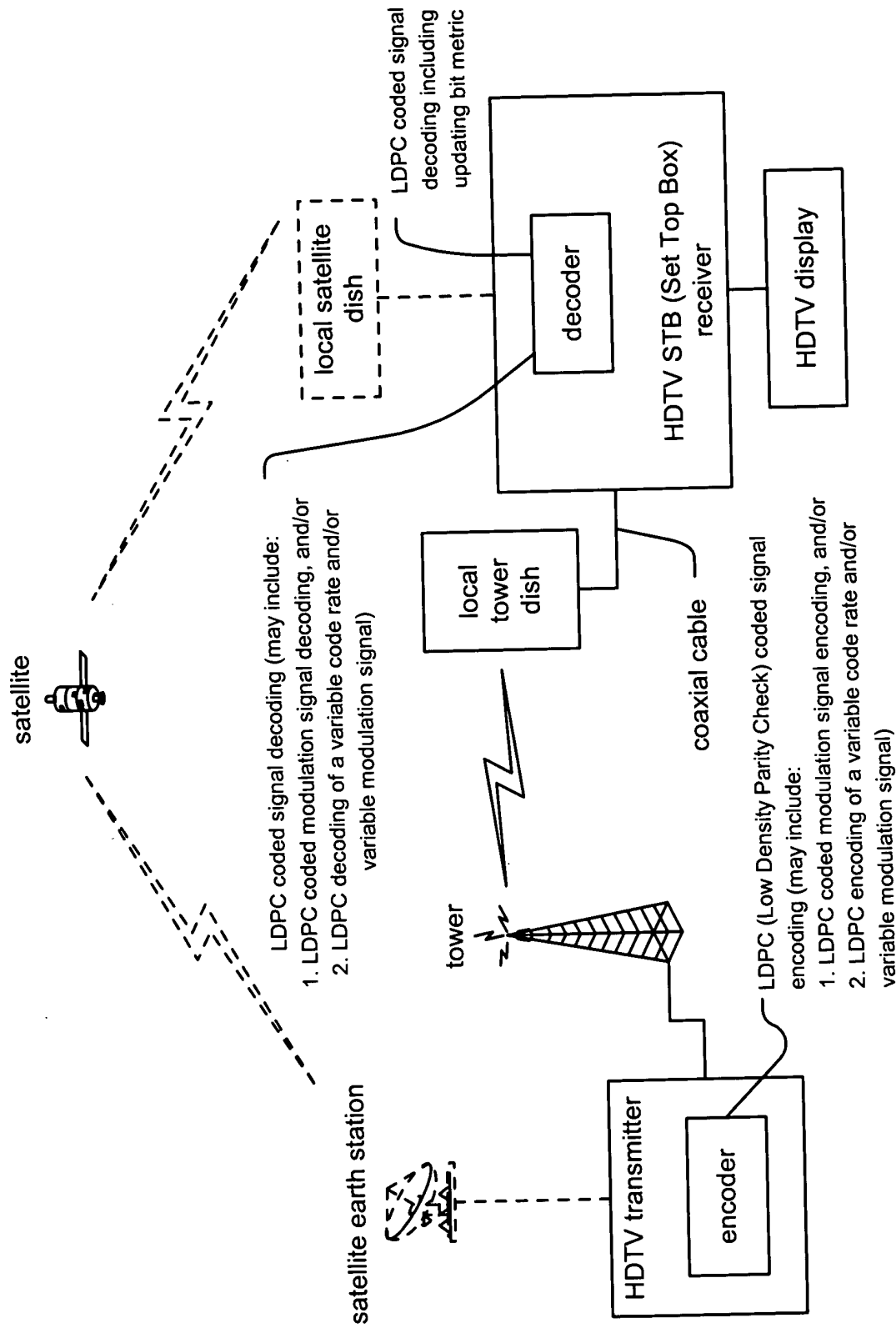


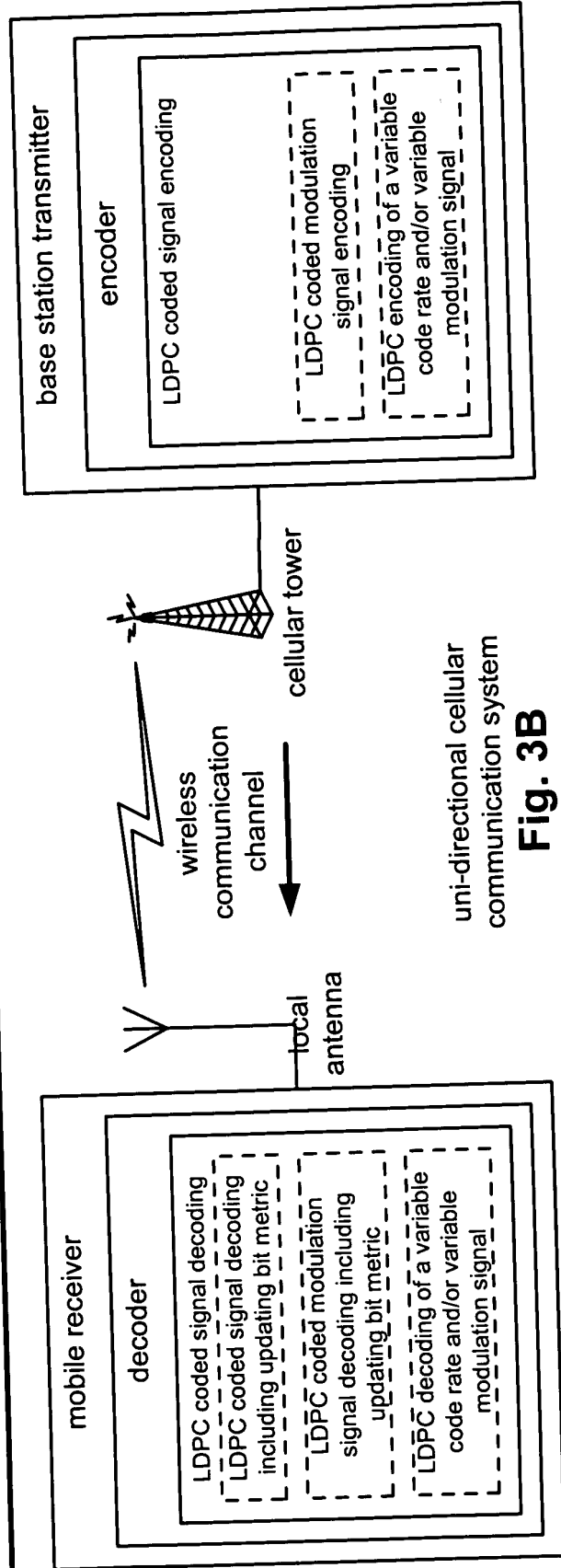
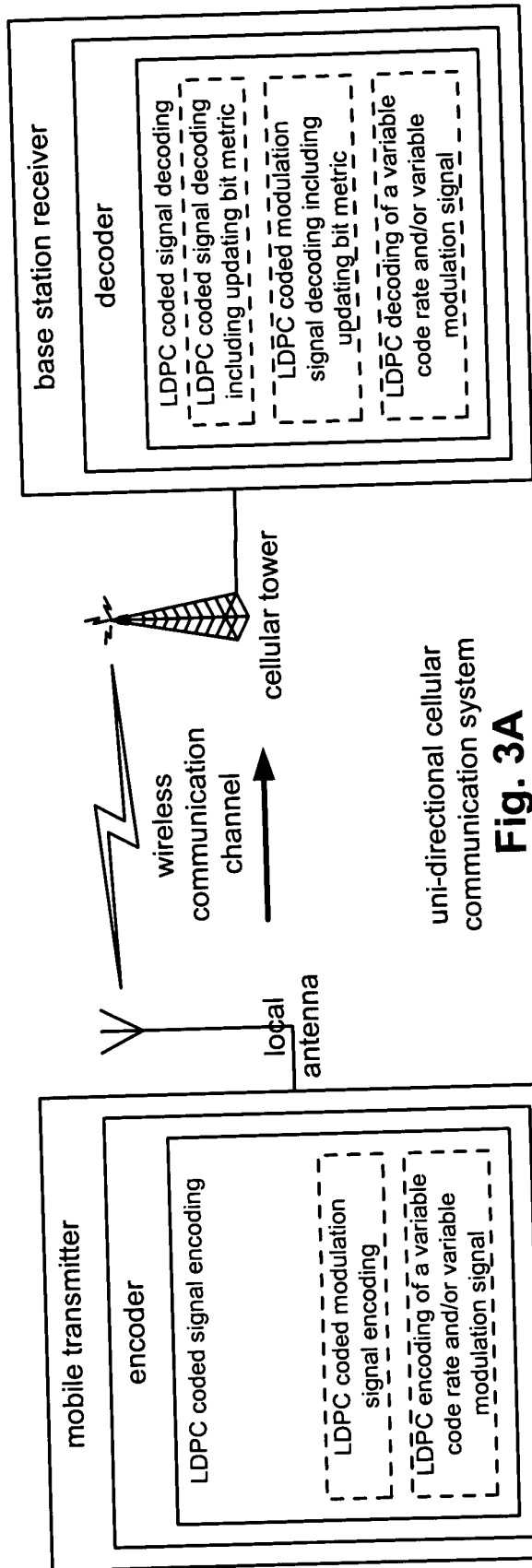
satellite communication system

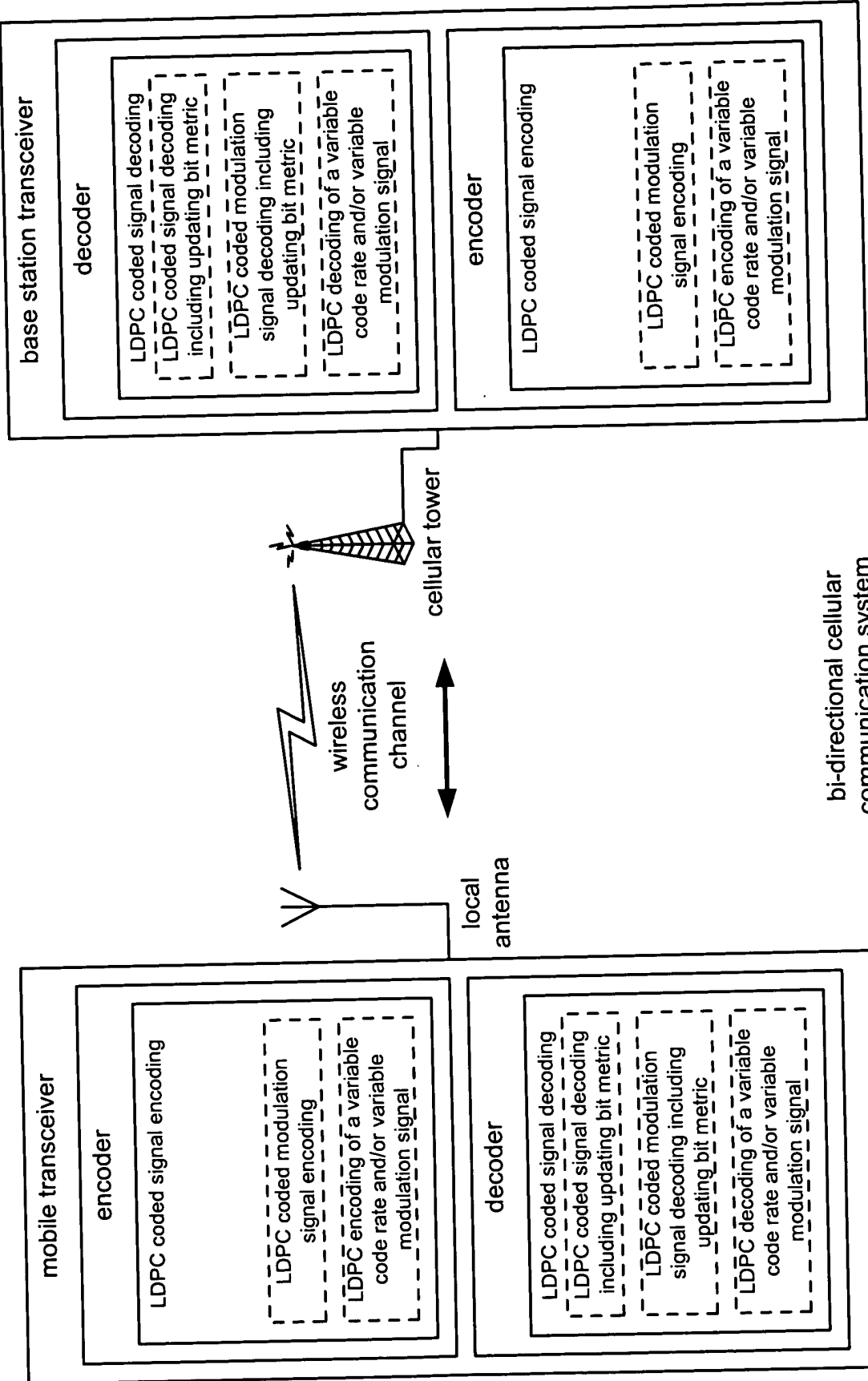
**Fig. 1**



HDTV (High Definition Television) communication system

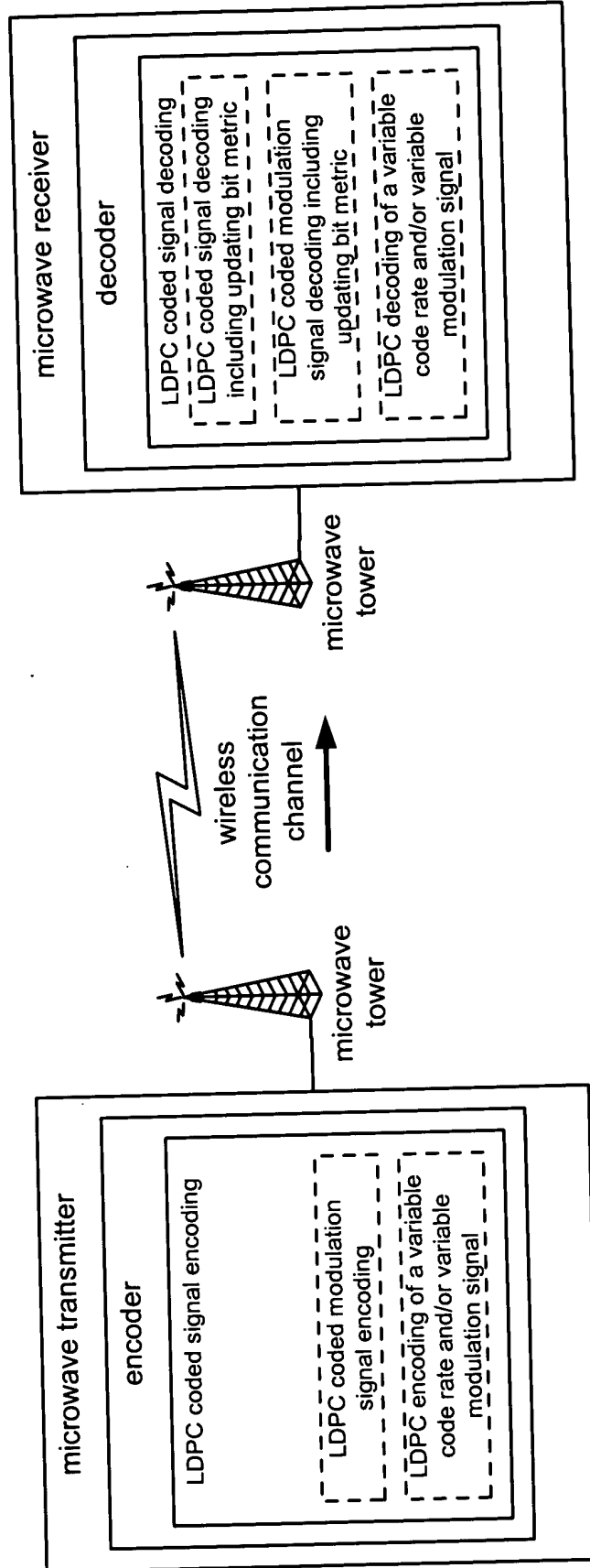
**Fig. 2**





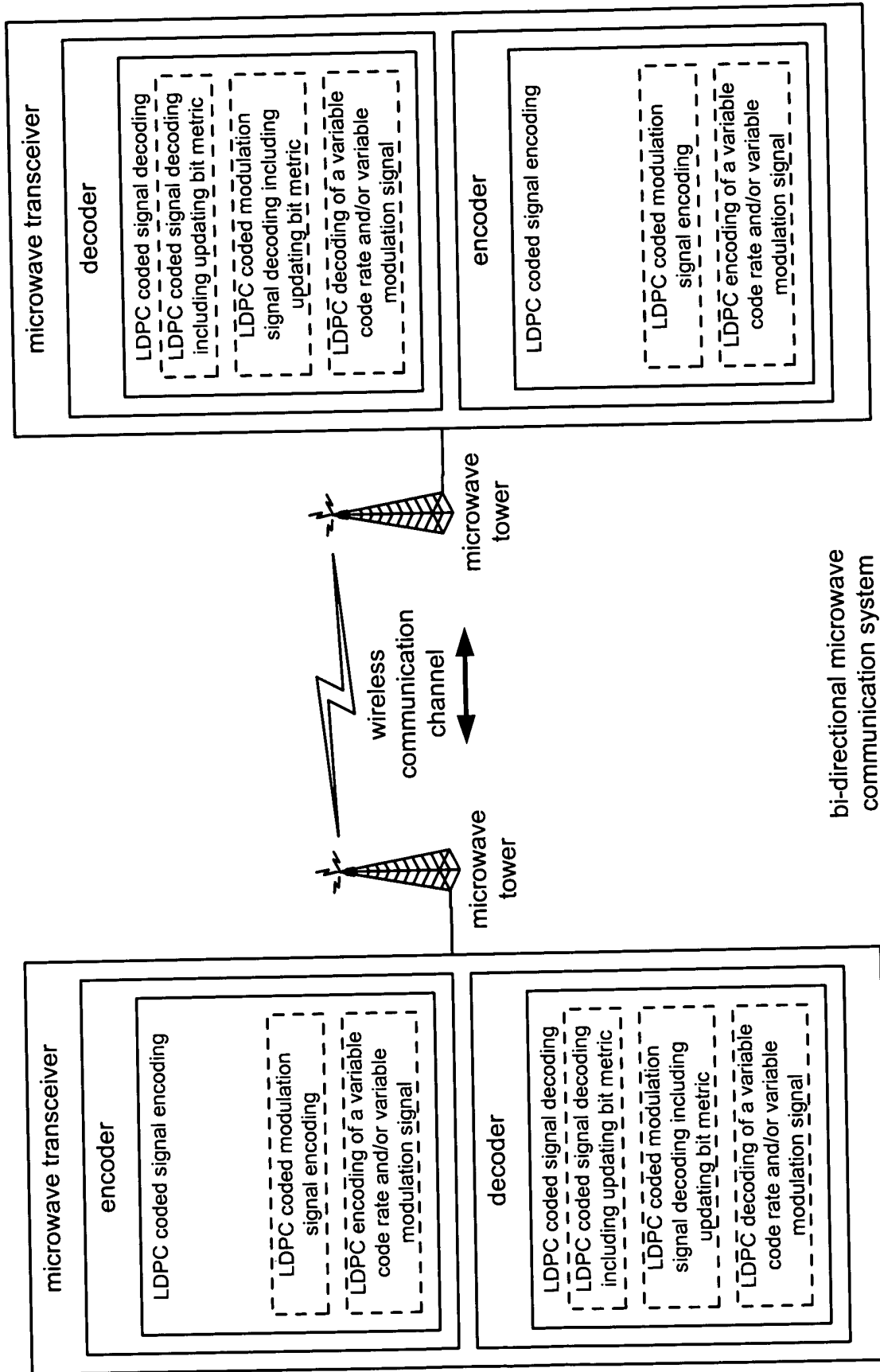
bi-directional cellular communication system

Fig. 4



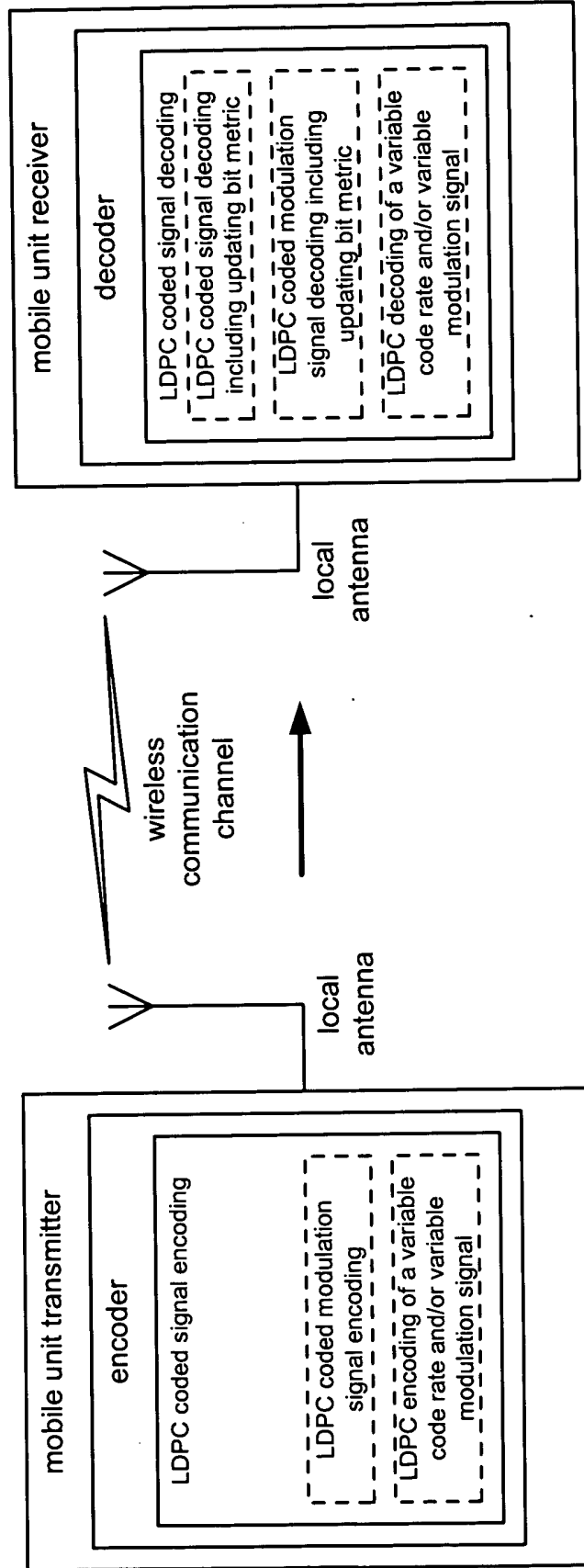
uni-directional microwave communication system

**Fig. 5**



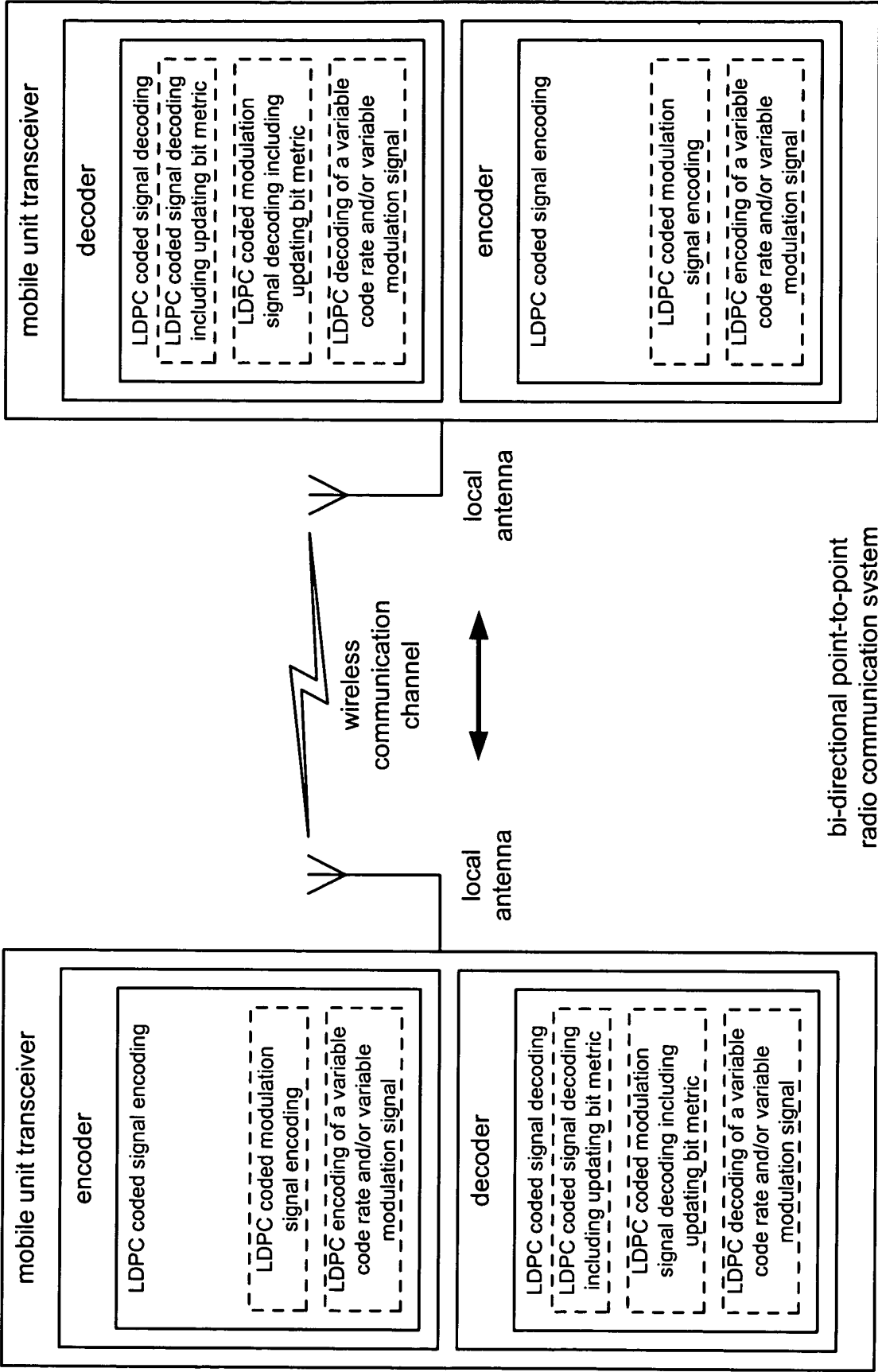
bi-directional microwave communication system

**Fig. 6**



uni-directional point-to-point radio communication system

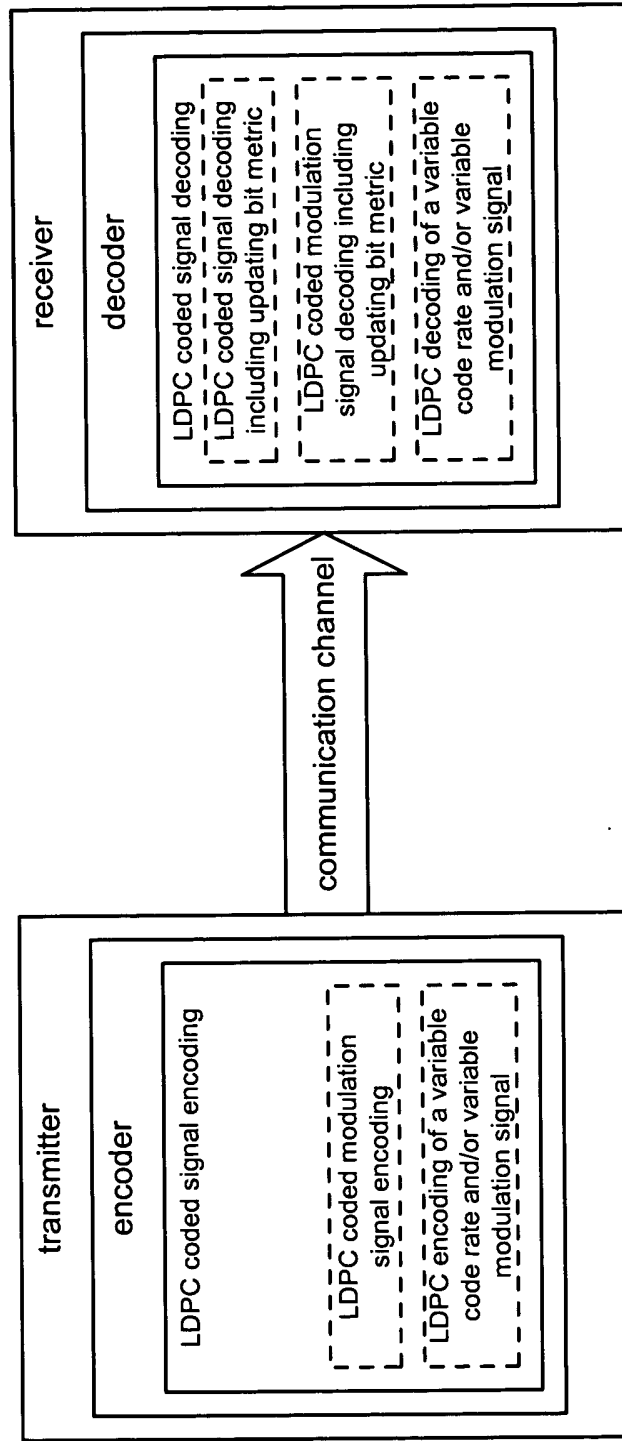
**Fig. 7**



bi-directional point-to-point  
radio communication system

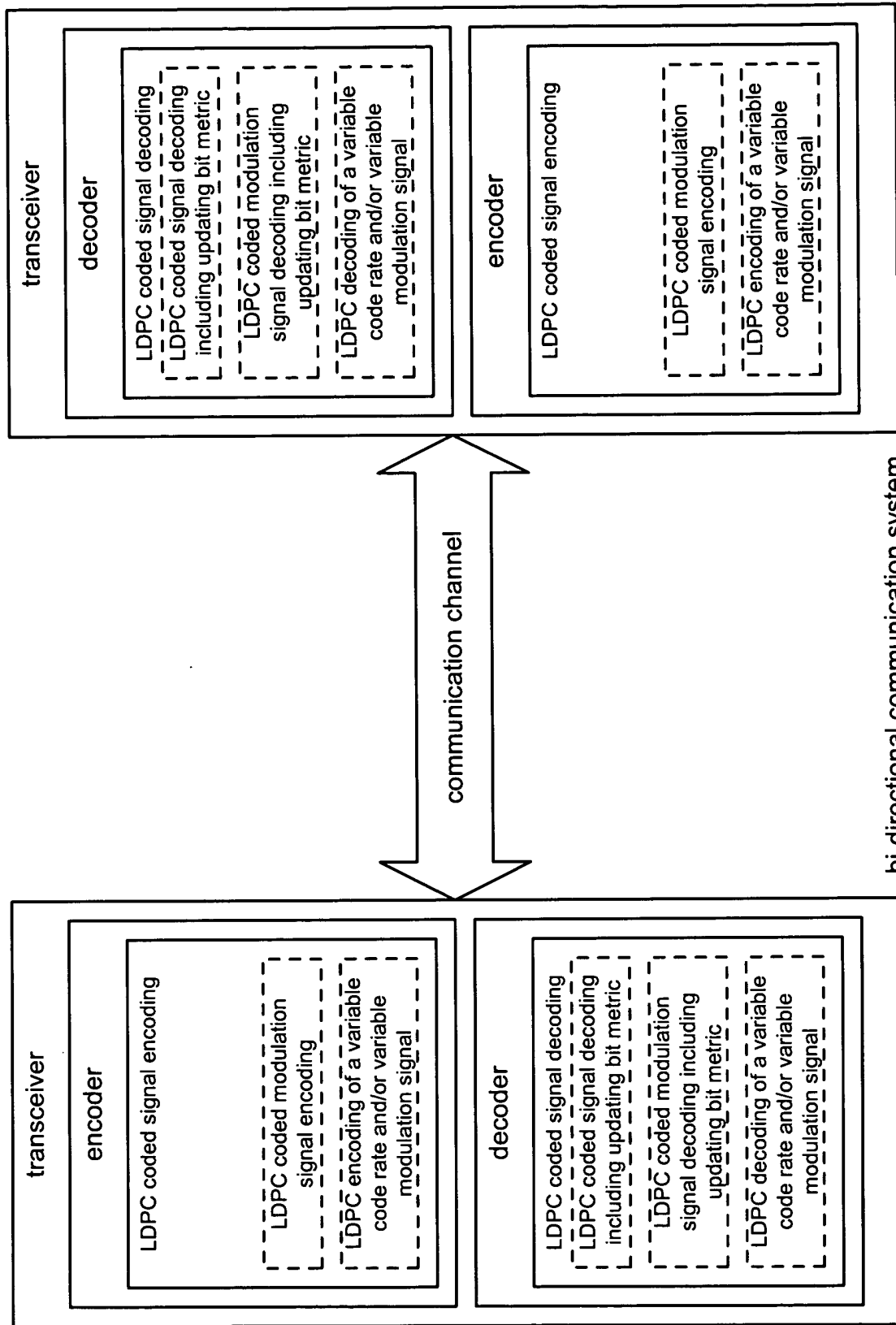
**Fig. 8**





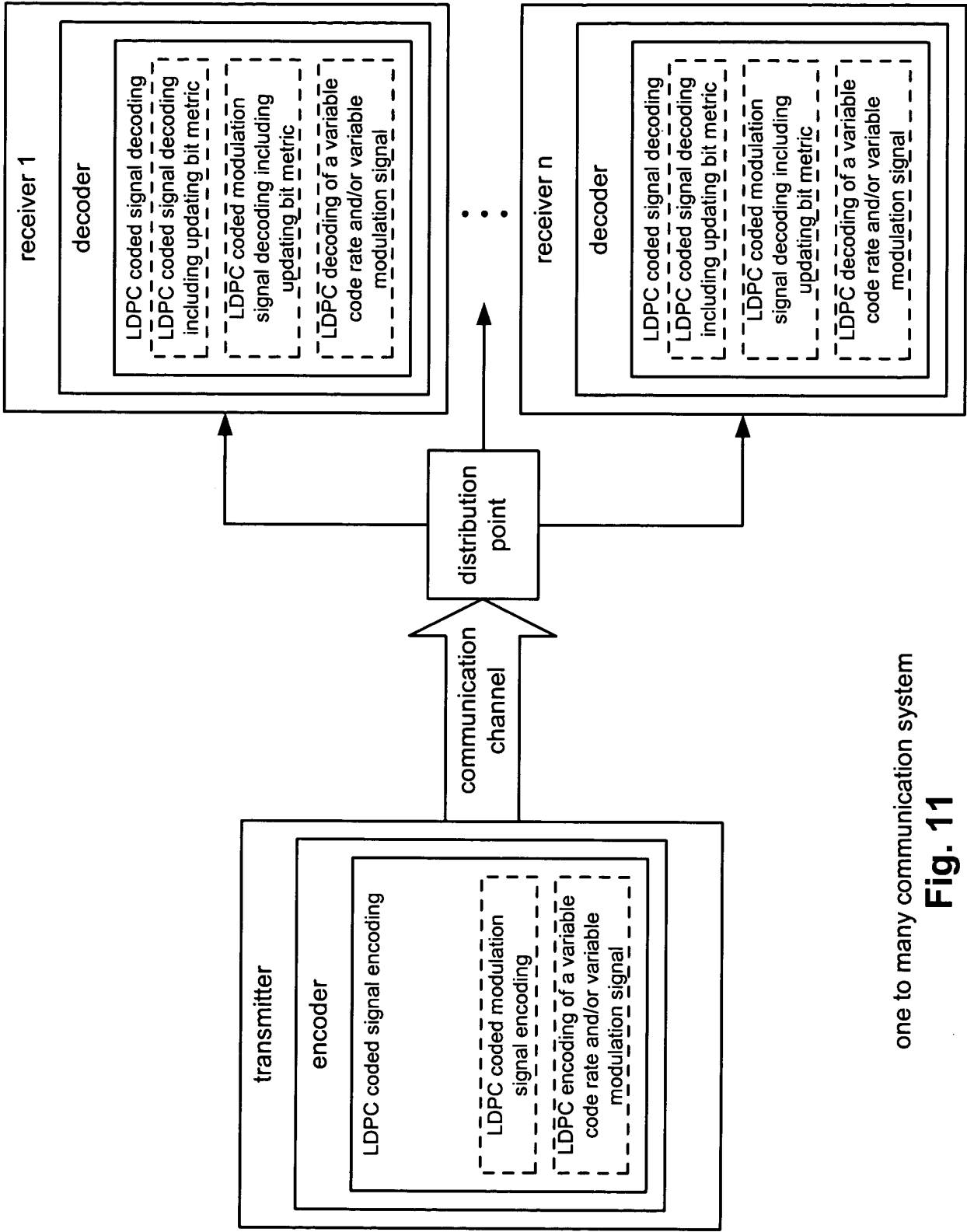
uni-directional communication system

**Fig. 9**



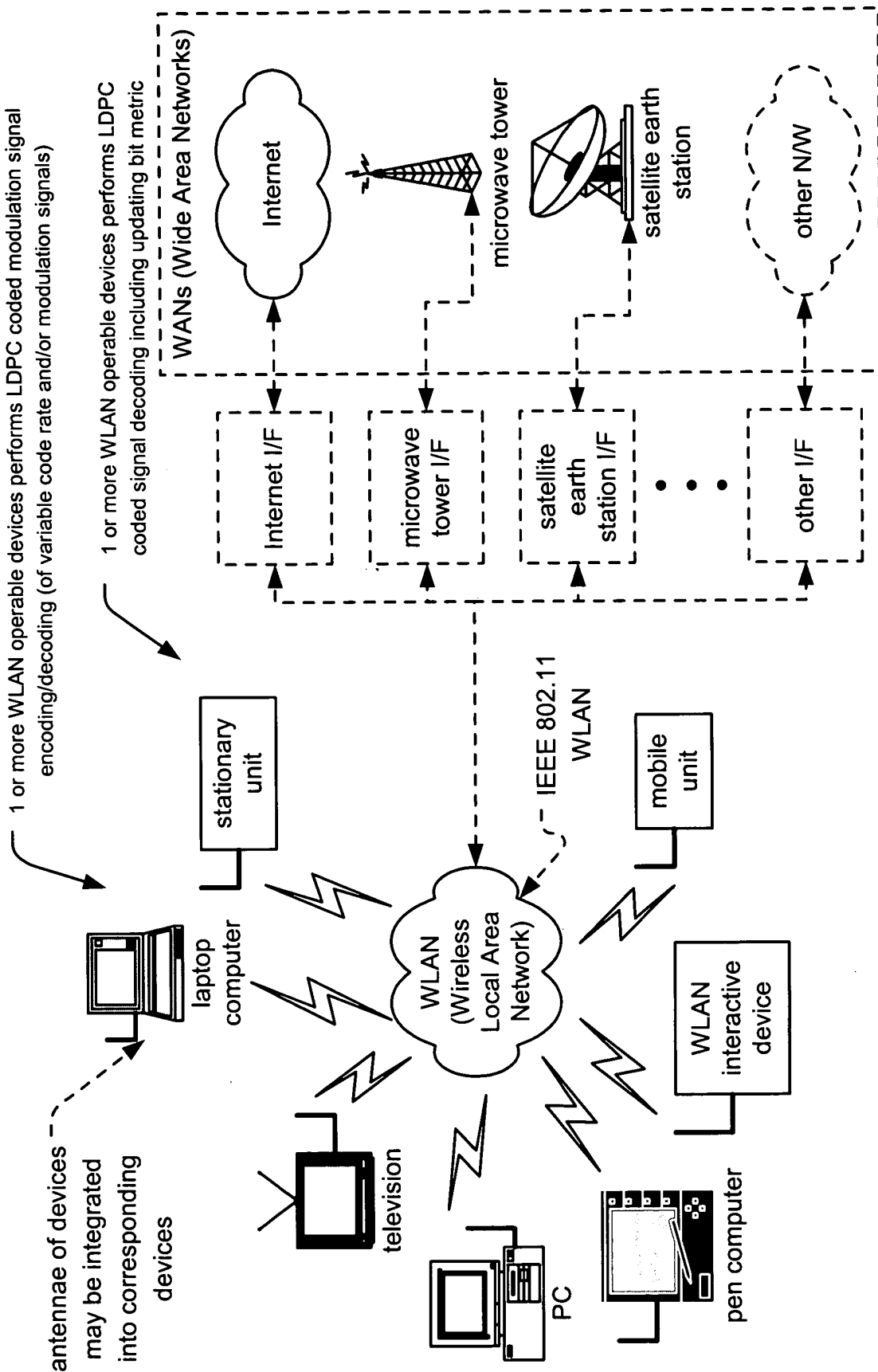
bi-directional communication system

**Fig. 10**



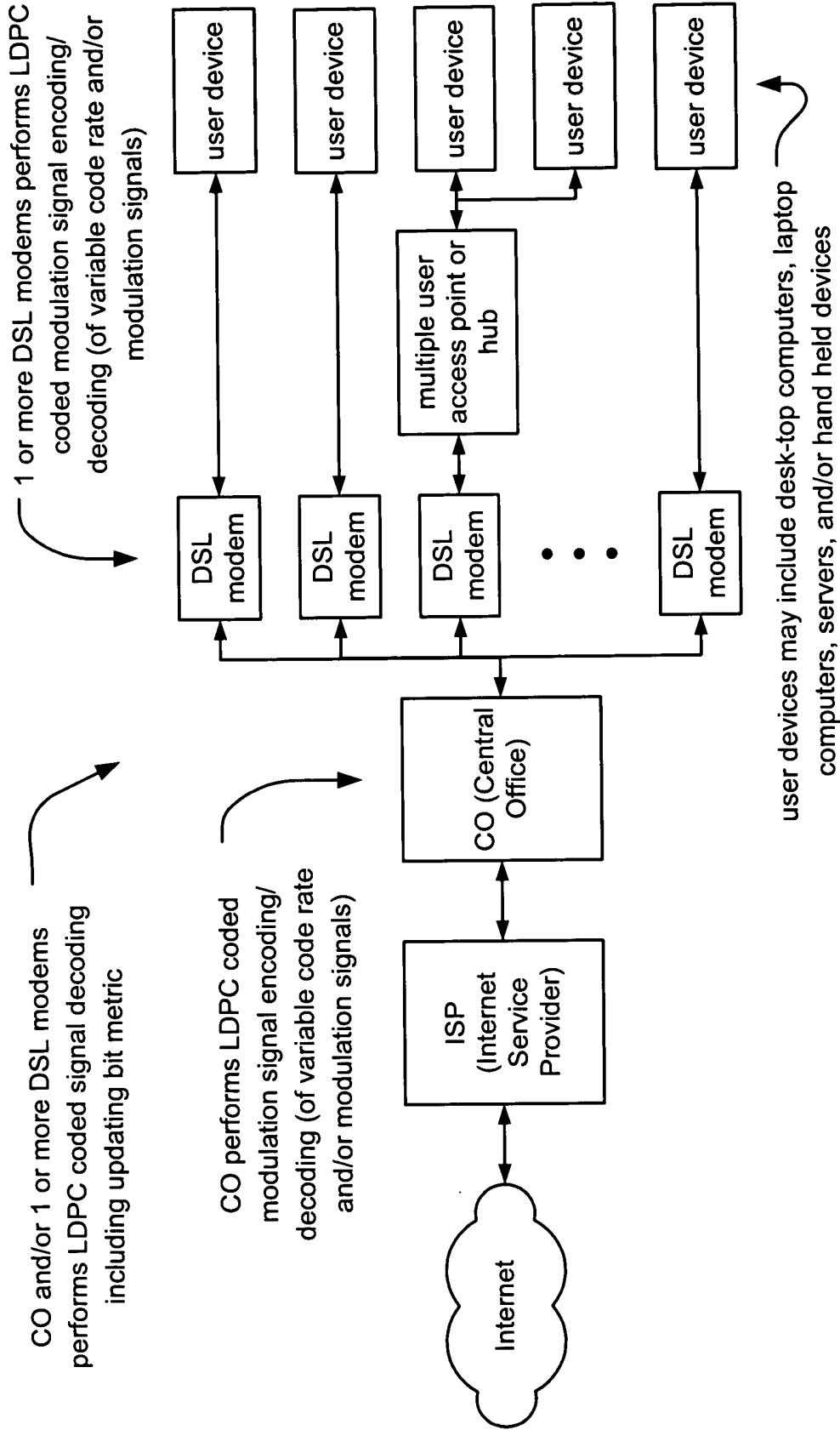
one to many communication system

**Fig. 11**



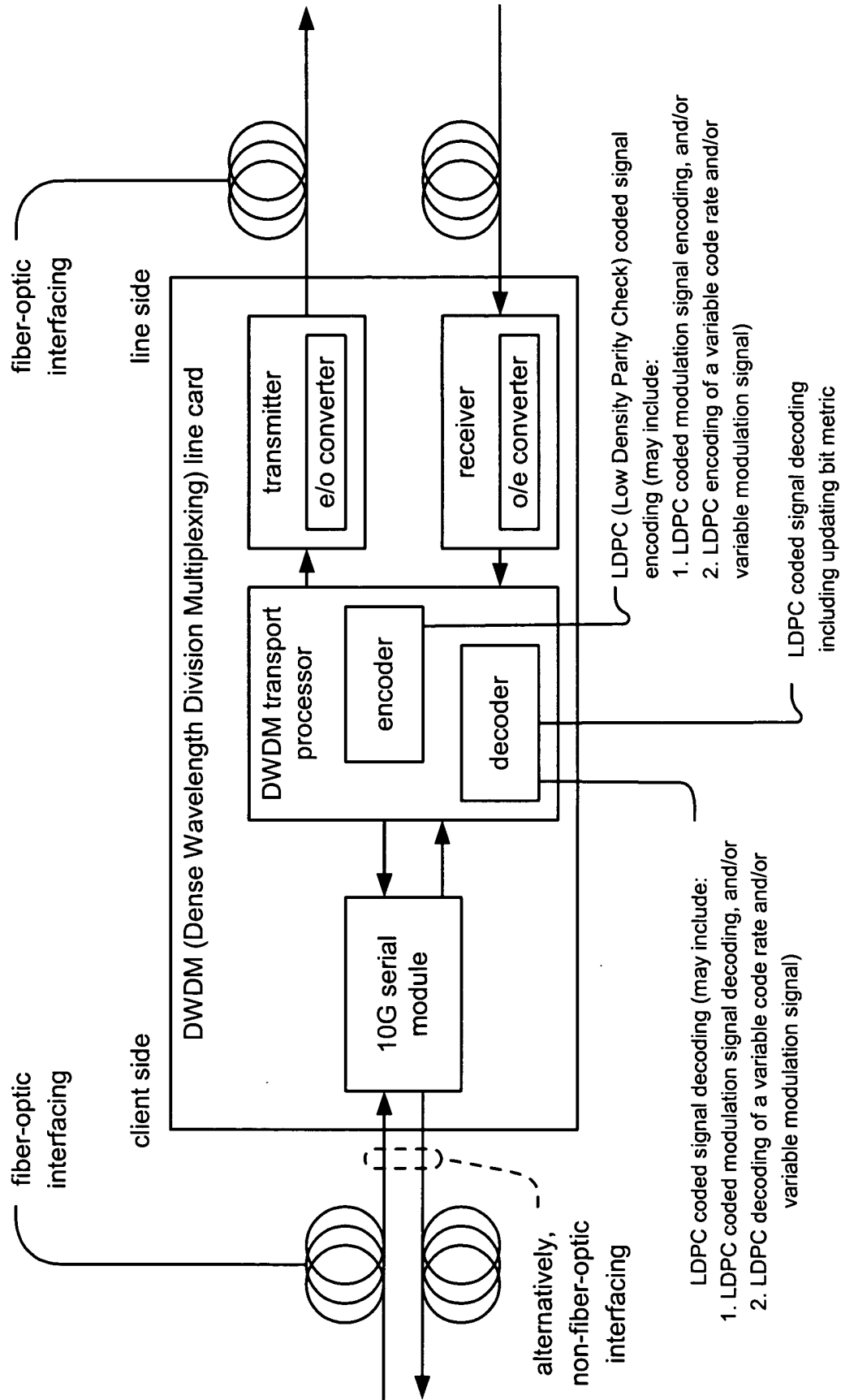
WLAN (Wireless Local Area Network) communication system

**Fig. 12**



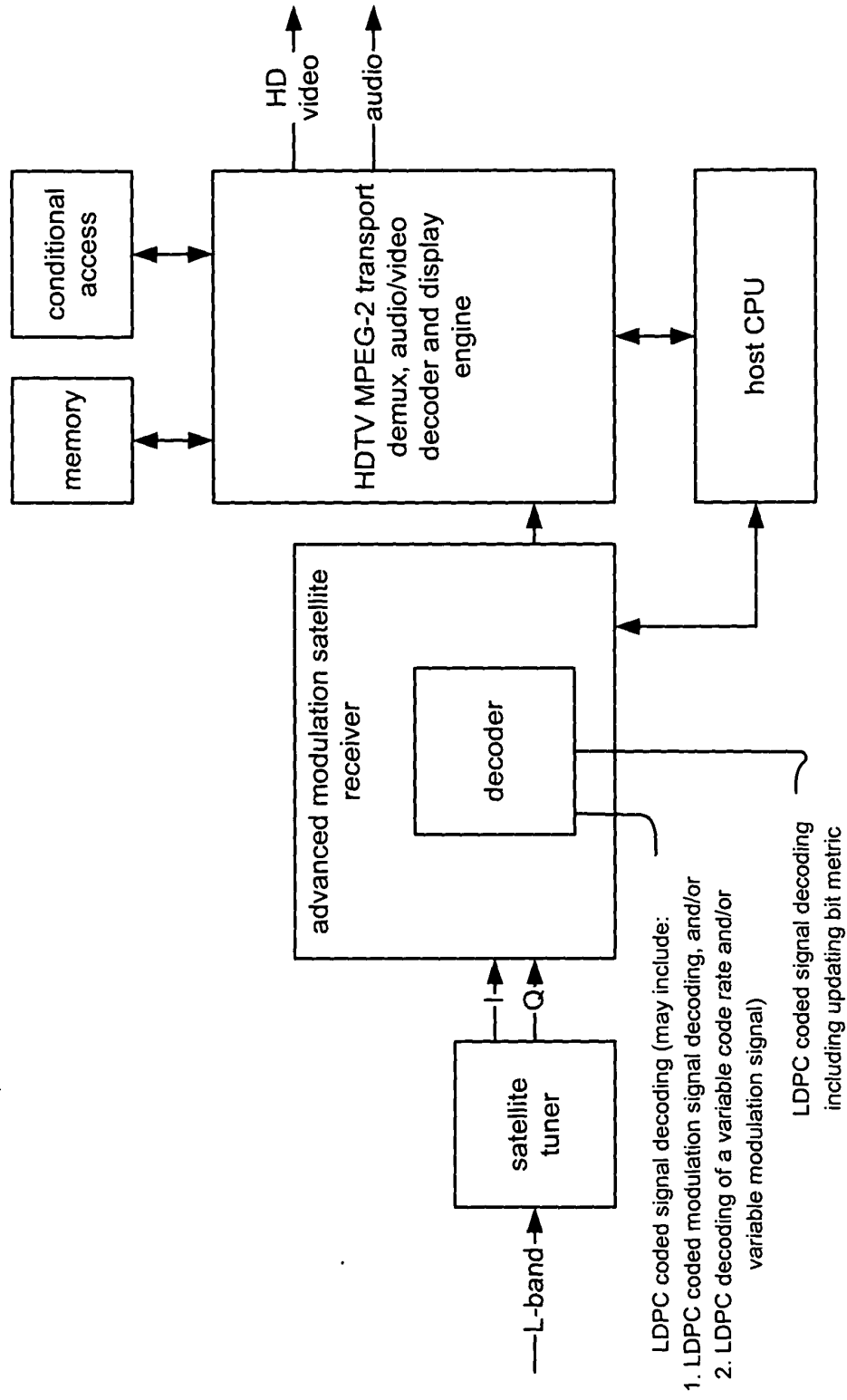
DSL (Digital Subscriber Line) communication system

**Fig. 13**

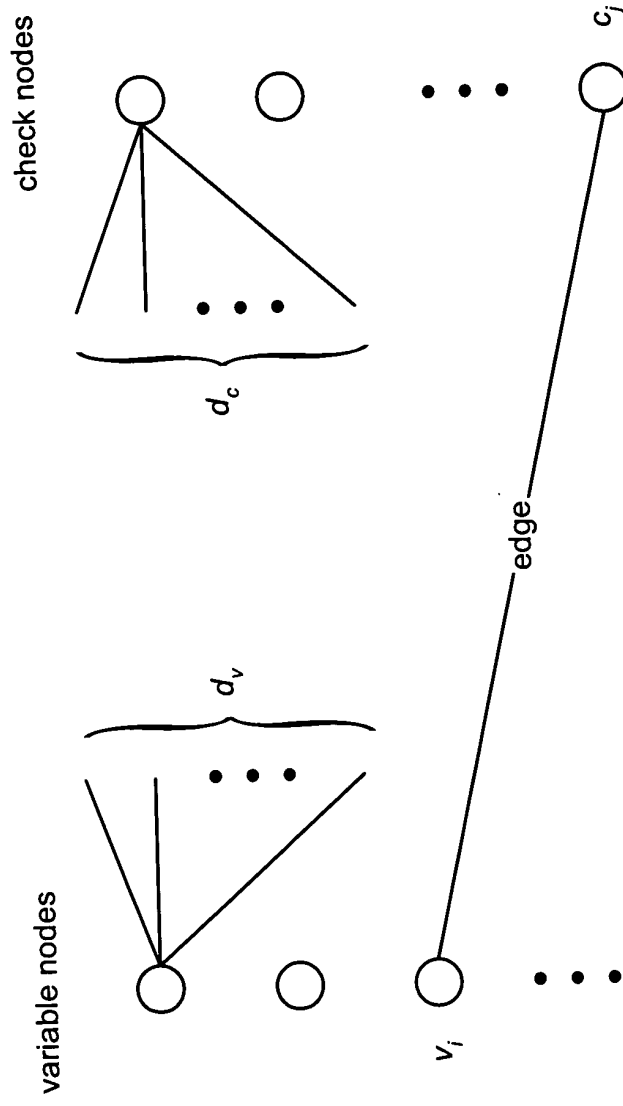


fiber-optic communication system

**Fig. 14**

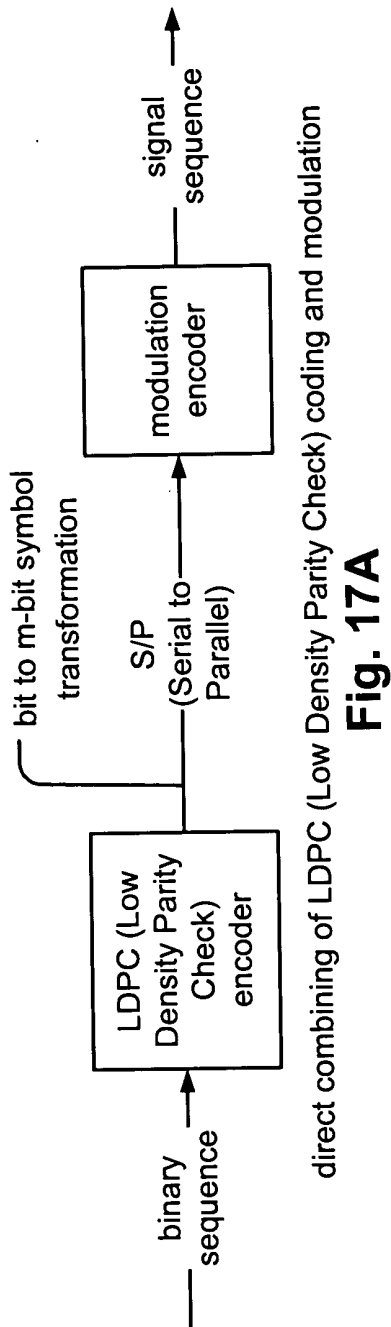


satellite receiver STB (Set Top Box) system  
**Fig. 15**



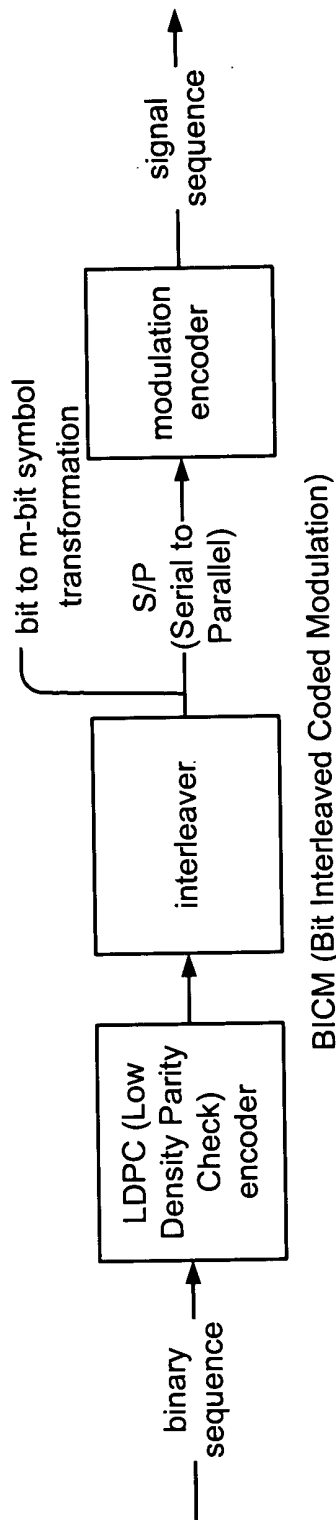
LDPC (Low Density Parity Check) code bipartite graph  
**Fig. 16**





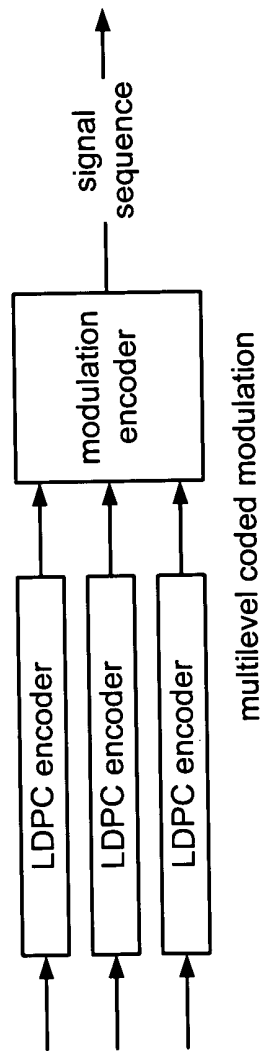
direct combining of LDPC (Low Density Parity Check) coding and modulation

**Fig. 17A**



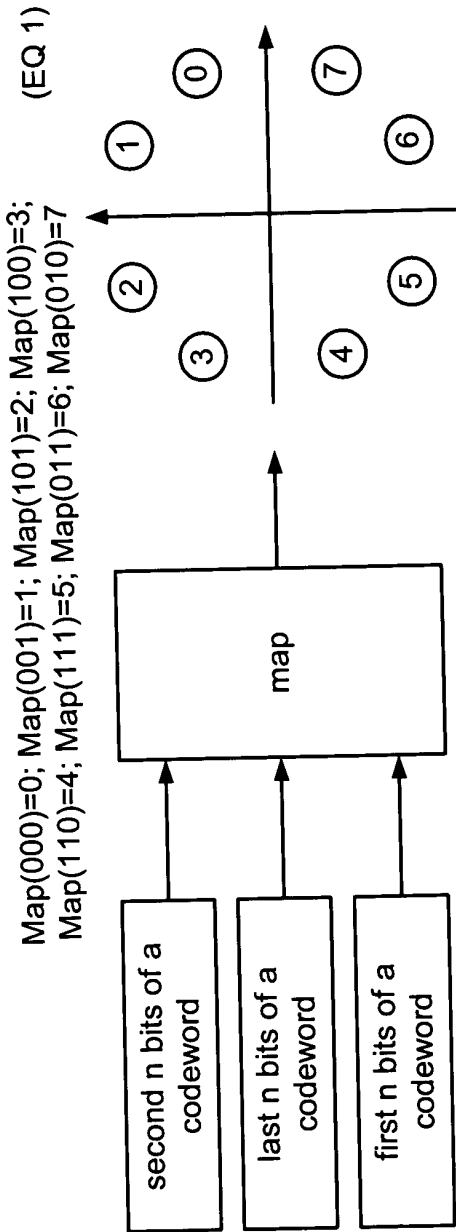
BICM (Bit Interleaved Coded Modulation)

**Fig. 17B**



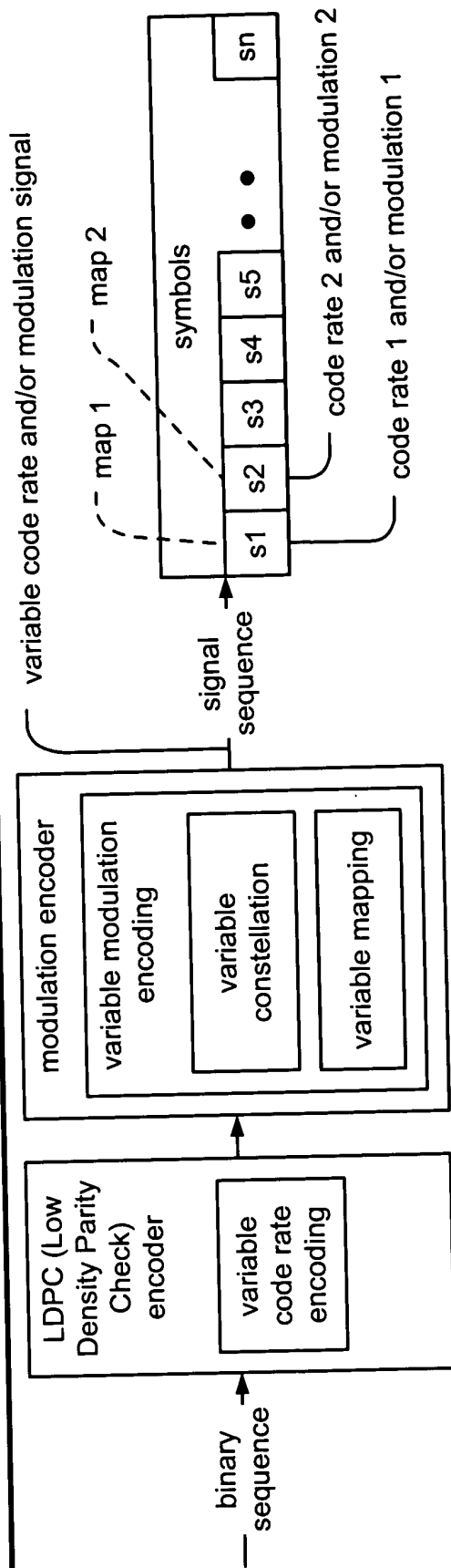
multilevel coded modulation

**Fig. 17C**



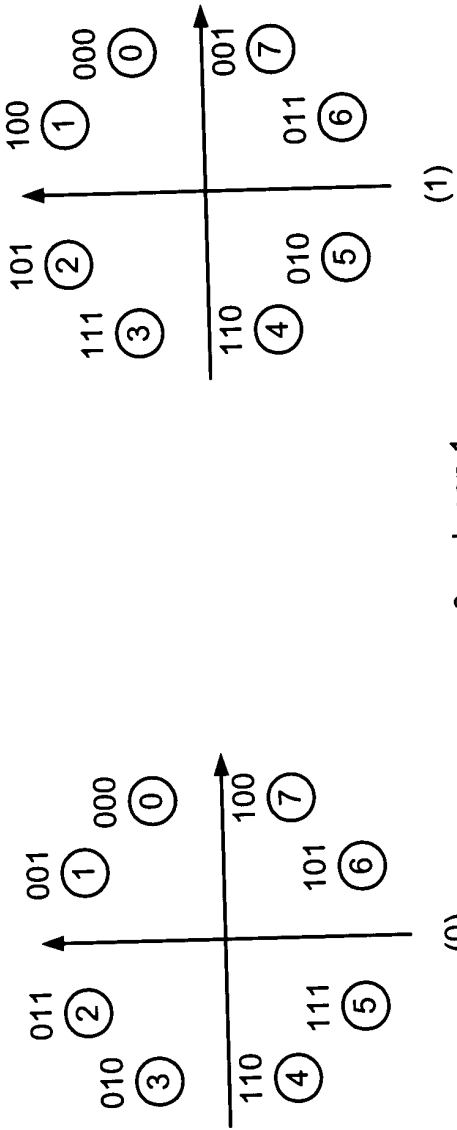
HNS (Hughes Network System) proposal to DVB (Digital Video Broadcasting Project) standard

Fig. 18A

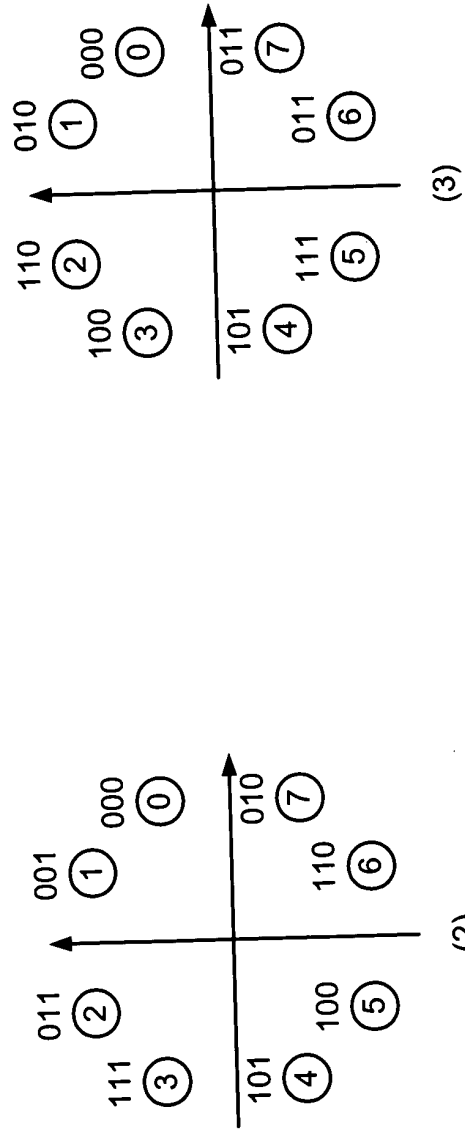


LDPC (Low Density Parity Check) coded modulation signal encoding

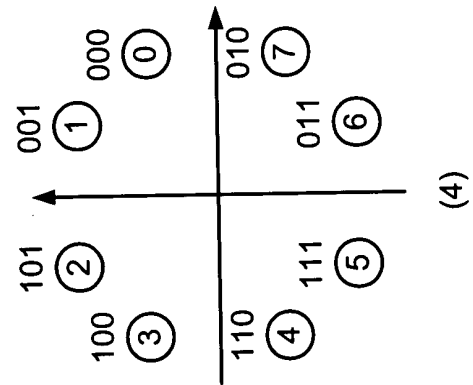
Fig. 18B



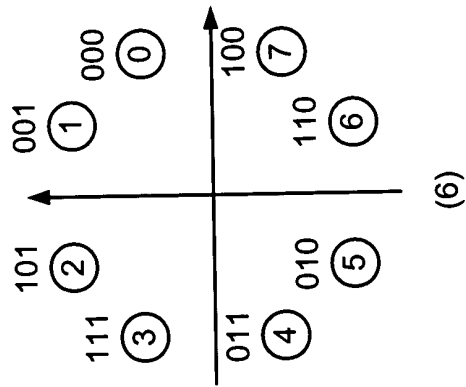
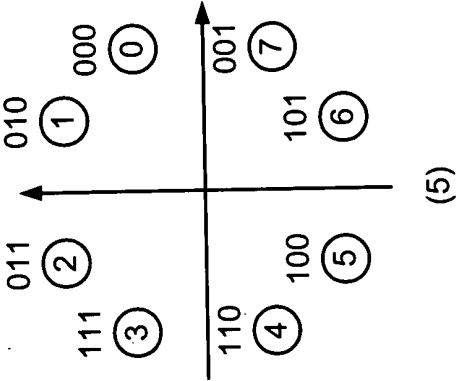
**Fig. 19A**



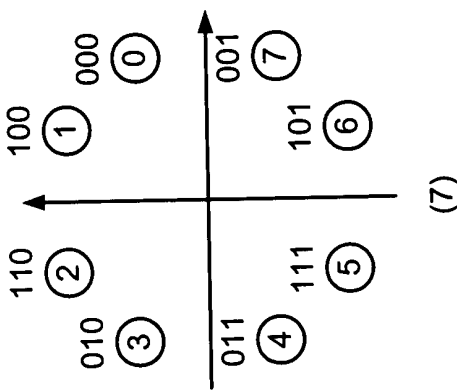
**Fig. 19B**

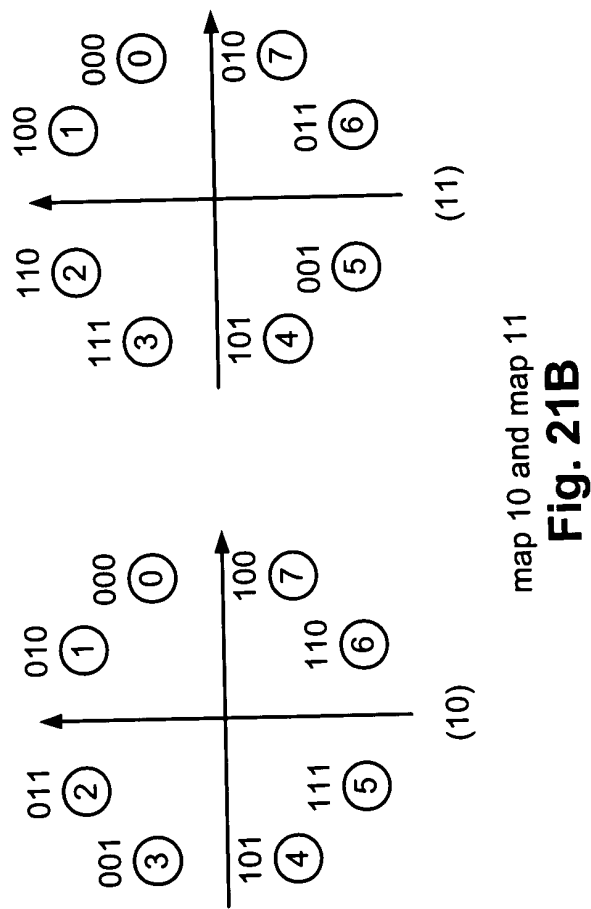
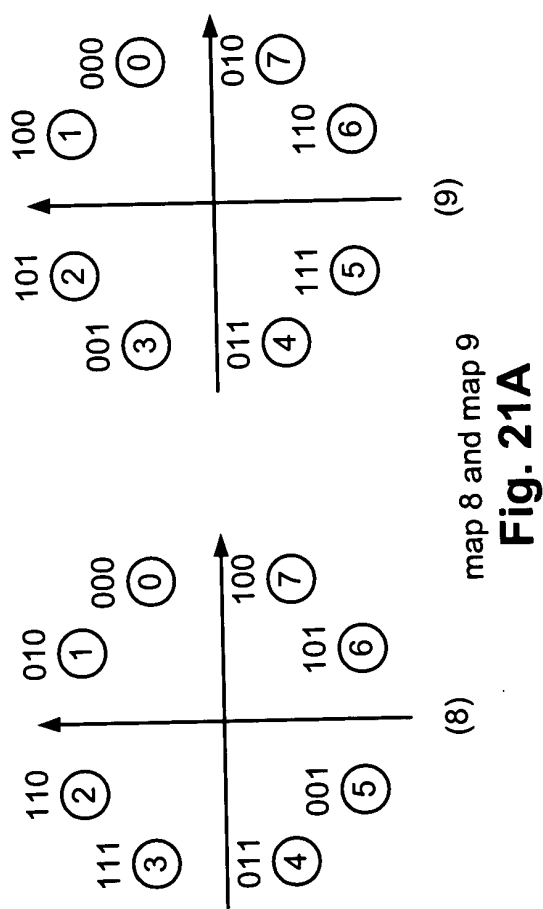


map 4 and map 5  
**Fig. 20A**



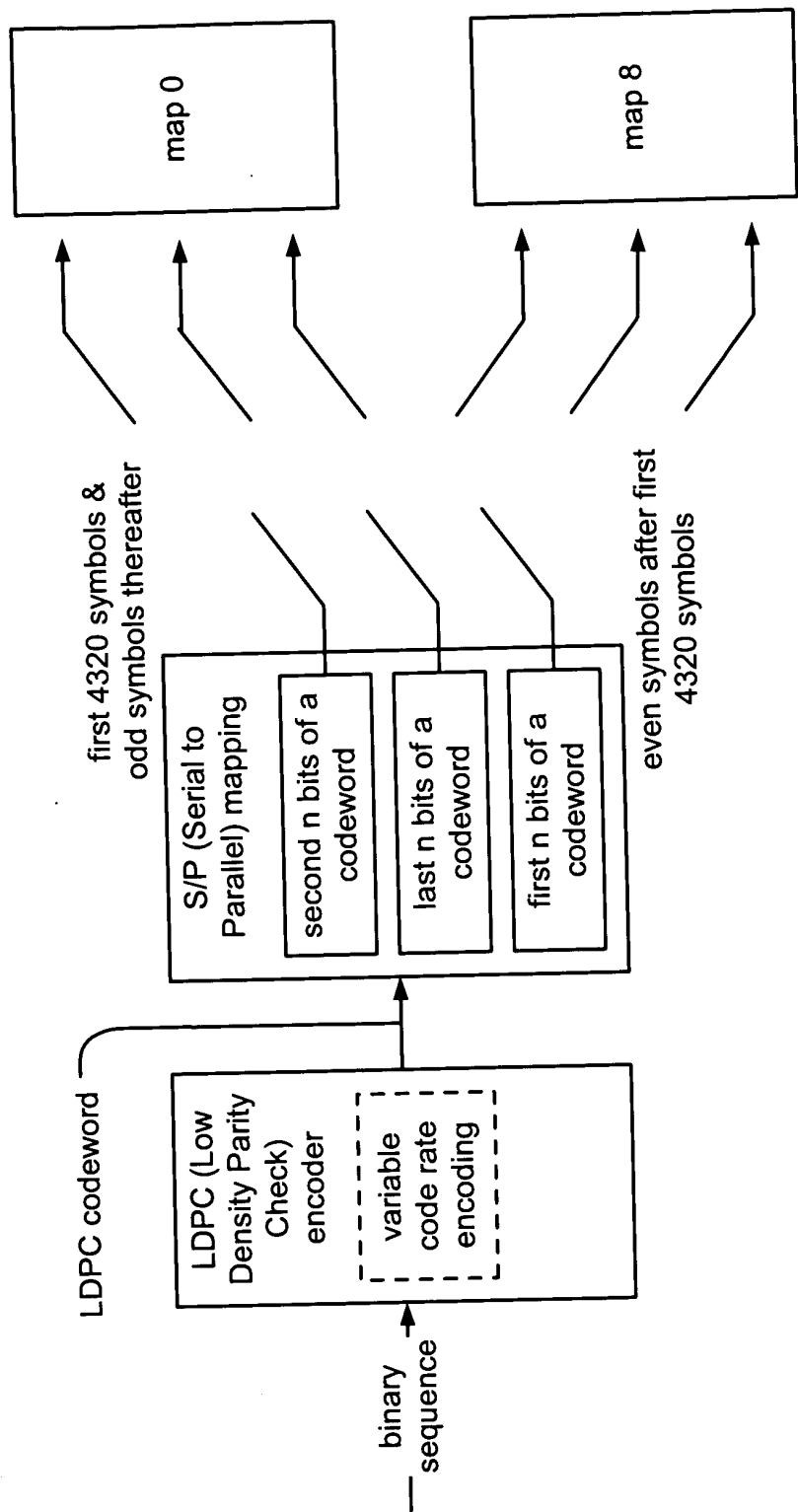
map 6 and map 7  
**Fig. 20B**





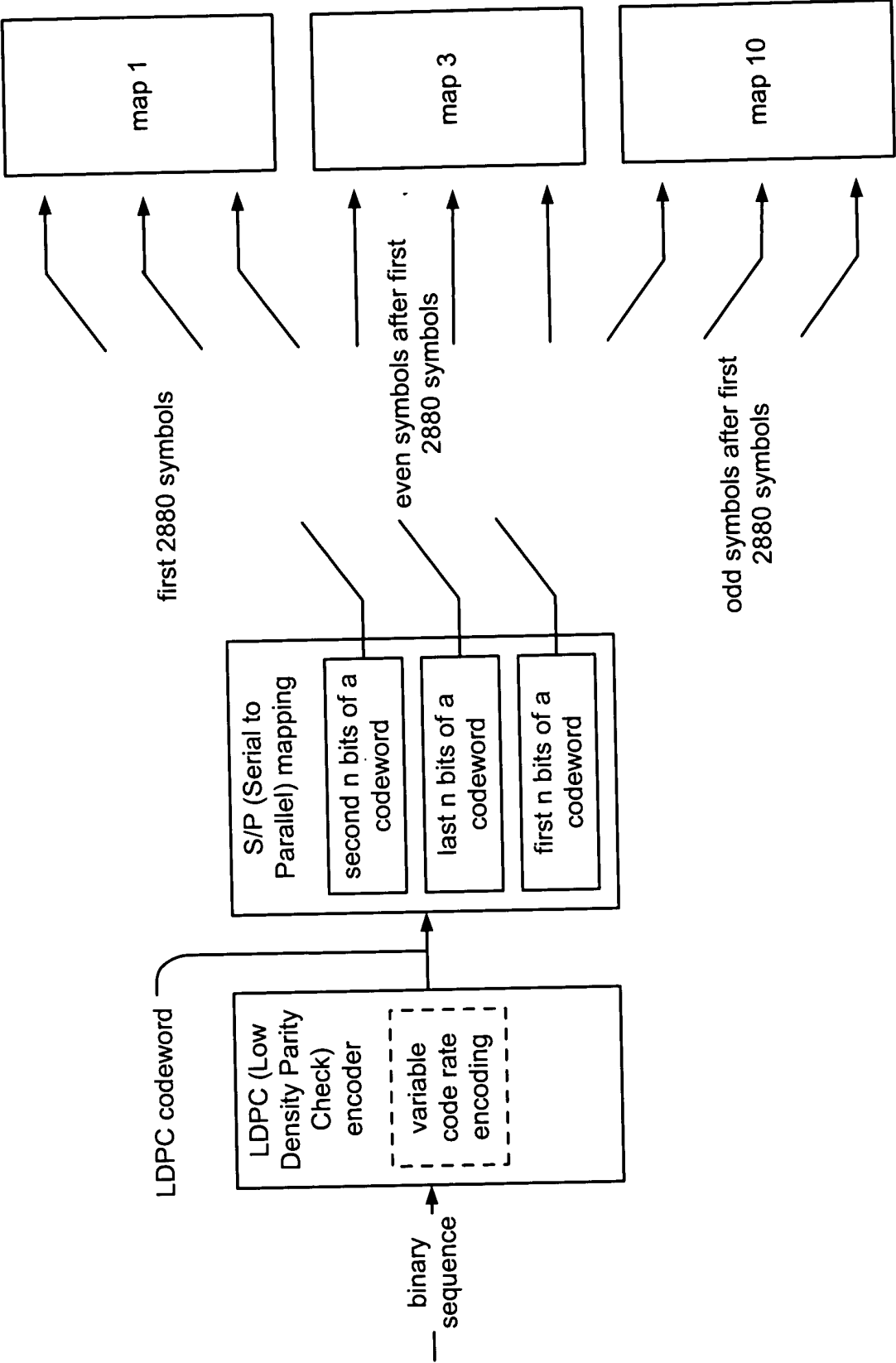
map number	# weak points at MSB	# weak points at ISB	# weak points at LSB
0	2	2	4
1	2	2	4
2	2	4	2
3	2	4	2
4	2	2	4
5	2	2	4
6	4	2	2
7	4	2	2
8	4	2	2
9	4	2	2
10	2	4	2
11	2	4	2

Table I  
**Fig. 21C**



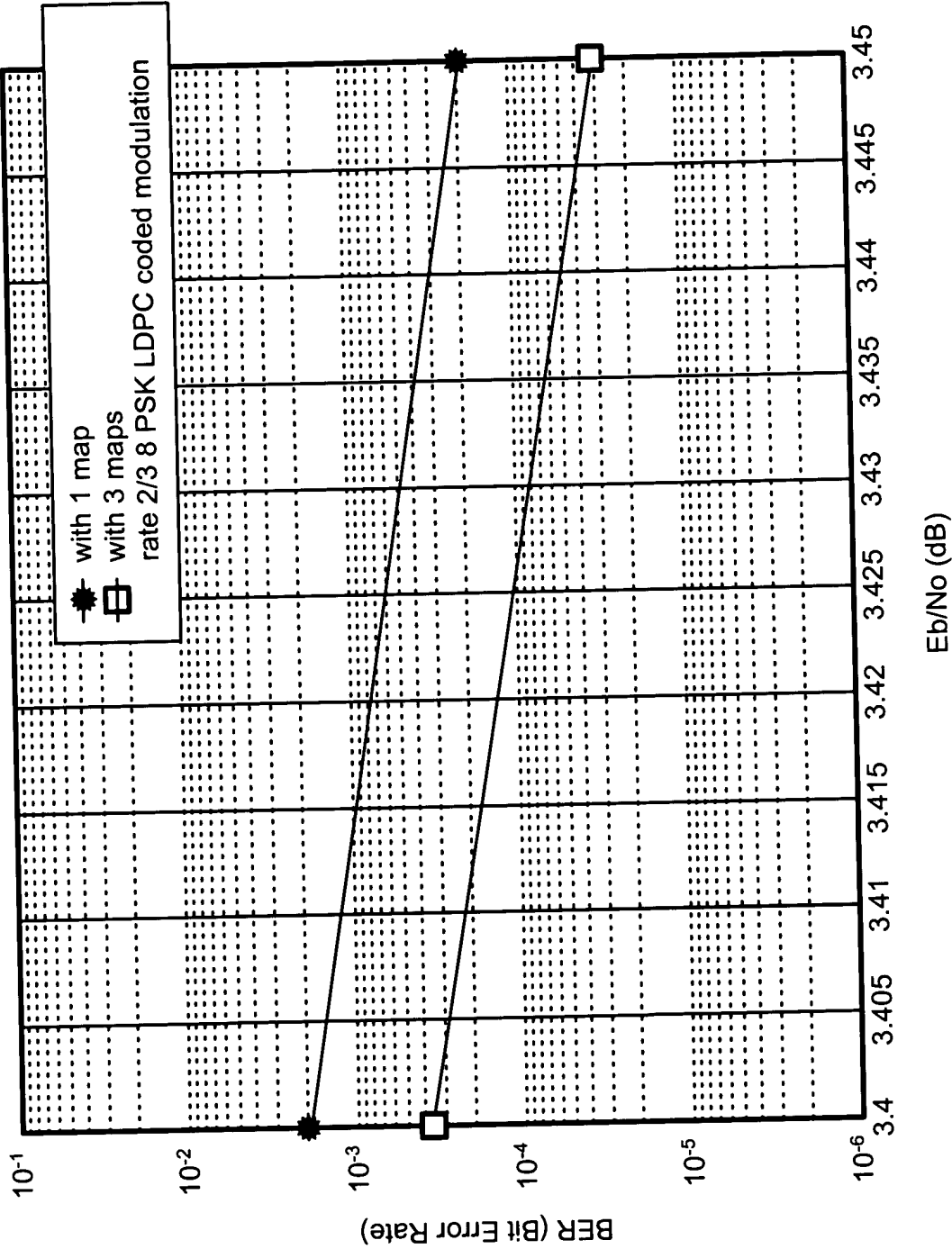
variable signal mapping LDPC (Low Density Parity Check) coded modulation system

Fig. 22



variable signal mapping LDPC (Low Density Parity Check) coded modulation system with code C<sub>2</sub>

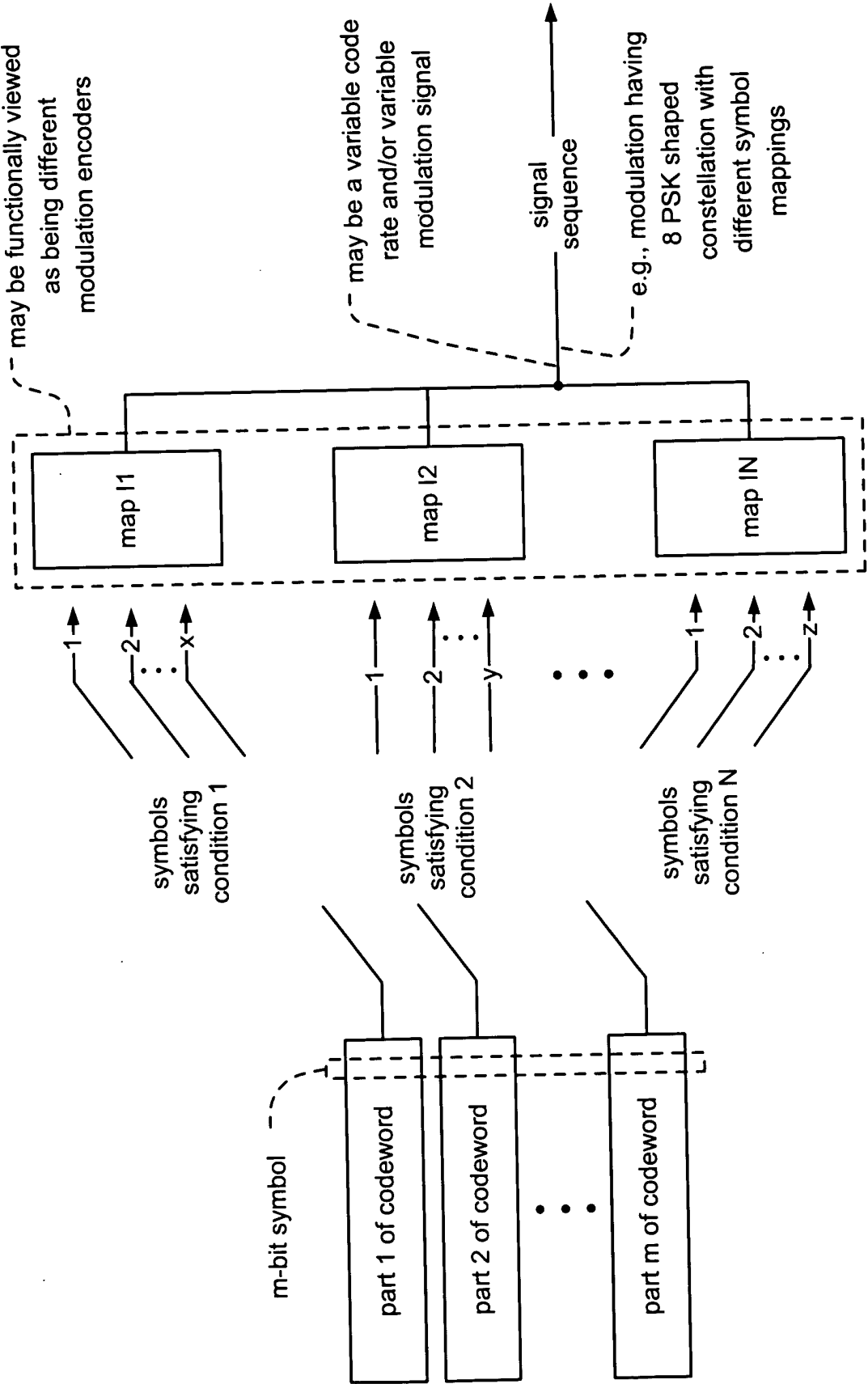
Fig. 23



performance comparison of single map vs. multiple maps (1 map vs. 3 maps)

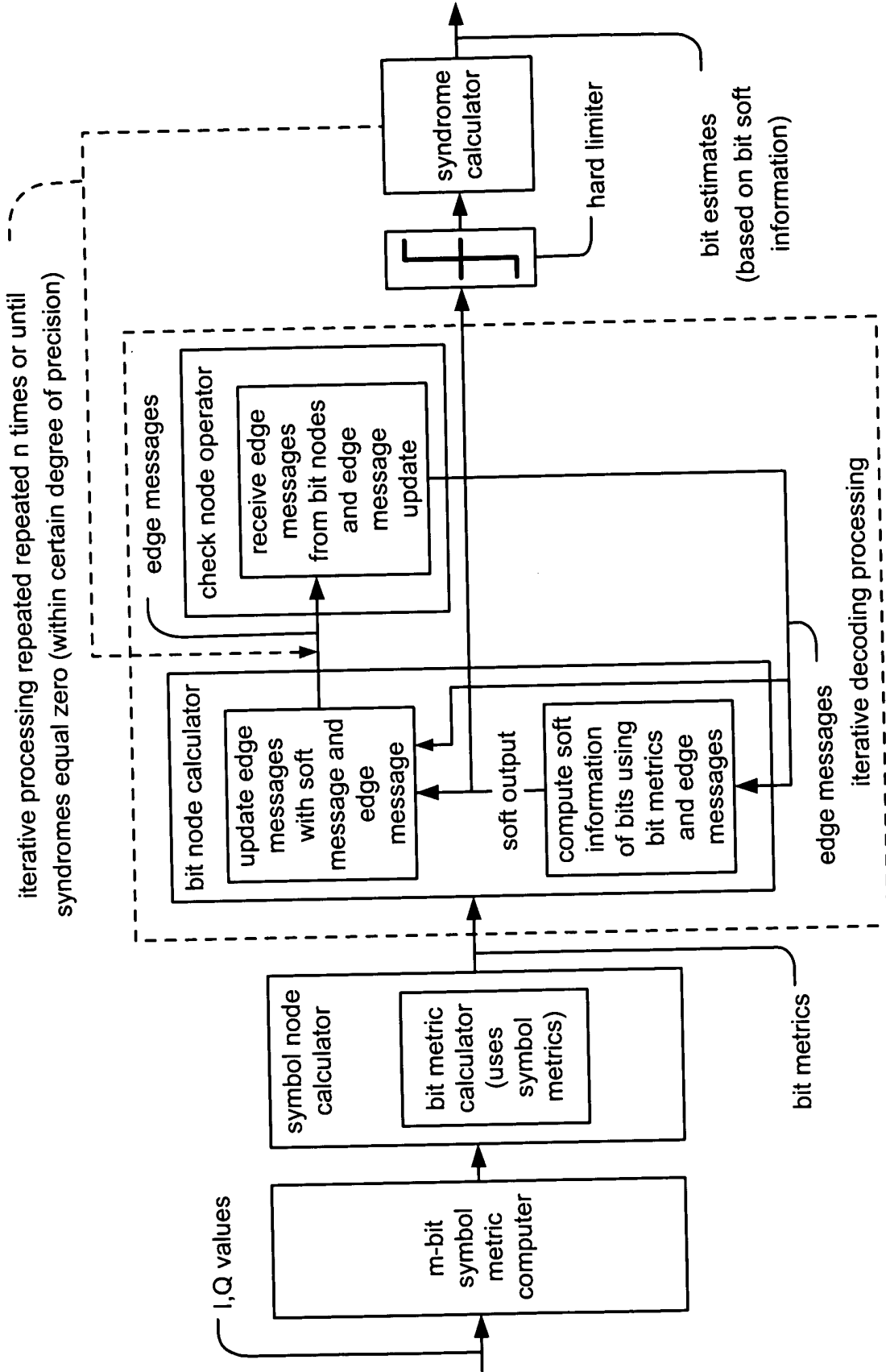
**Fig. 24**





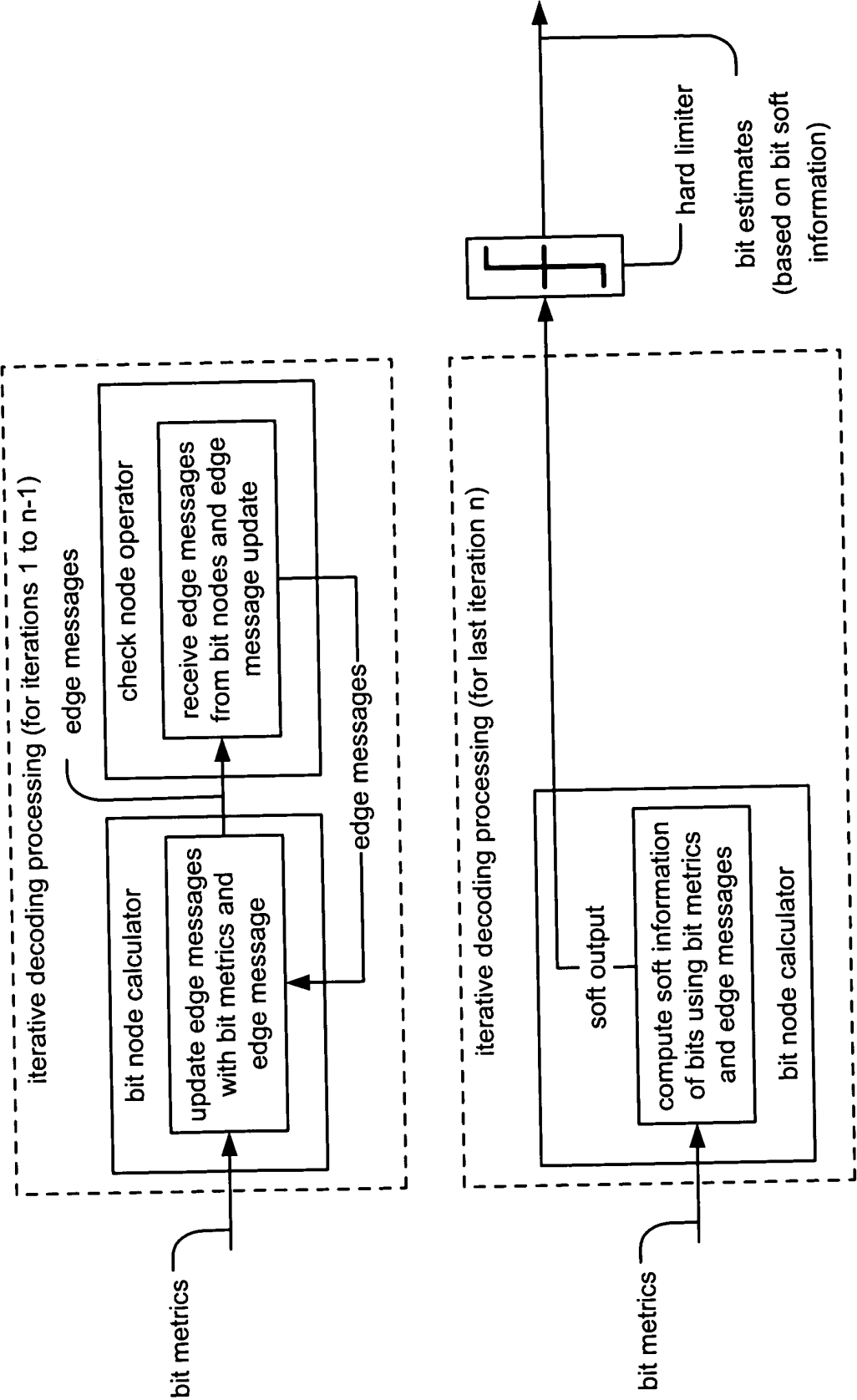
variable signal mapping LDPC (Low Density Parity Check) coded modulation system

**Fig. 25**

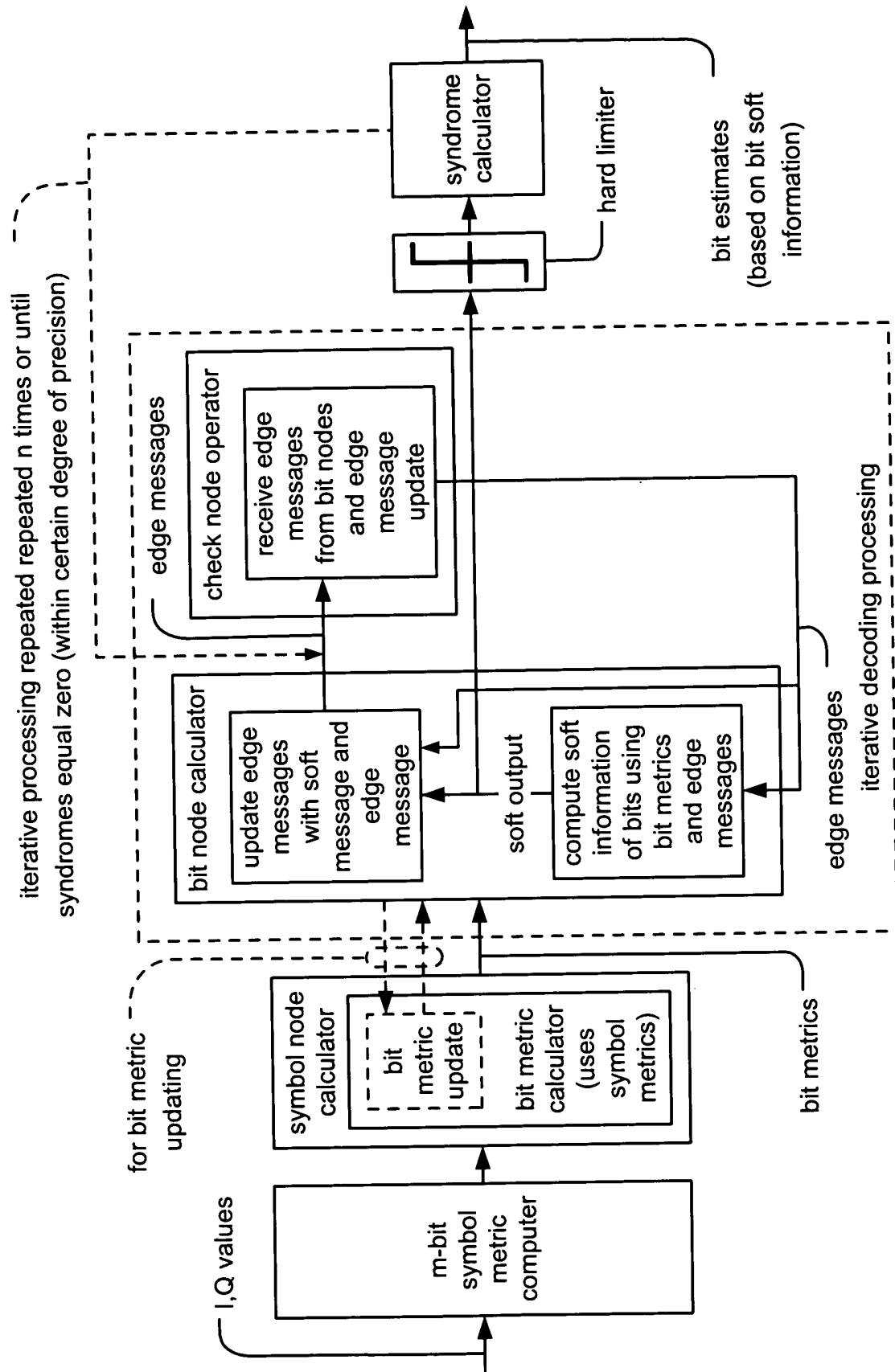


LDPC (Low Density Parity Check) coded modulation decoding functionality using bit metric

**Fig. 26**

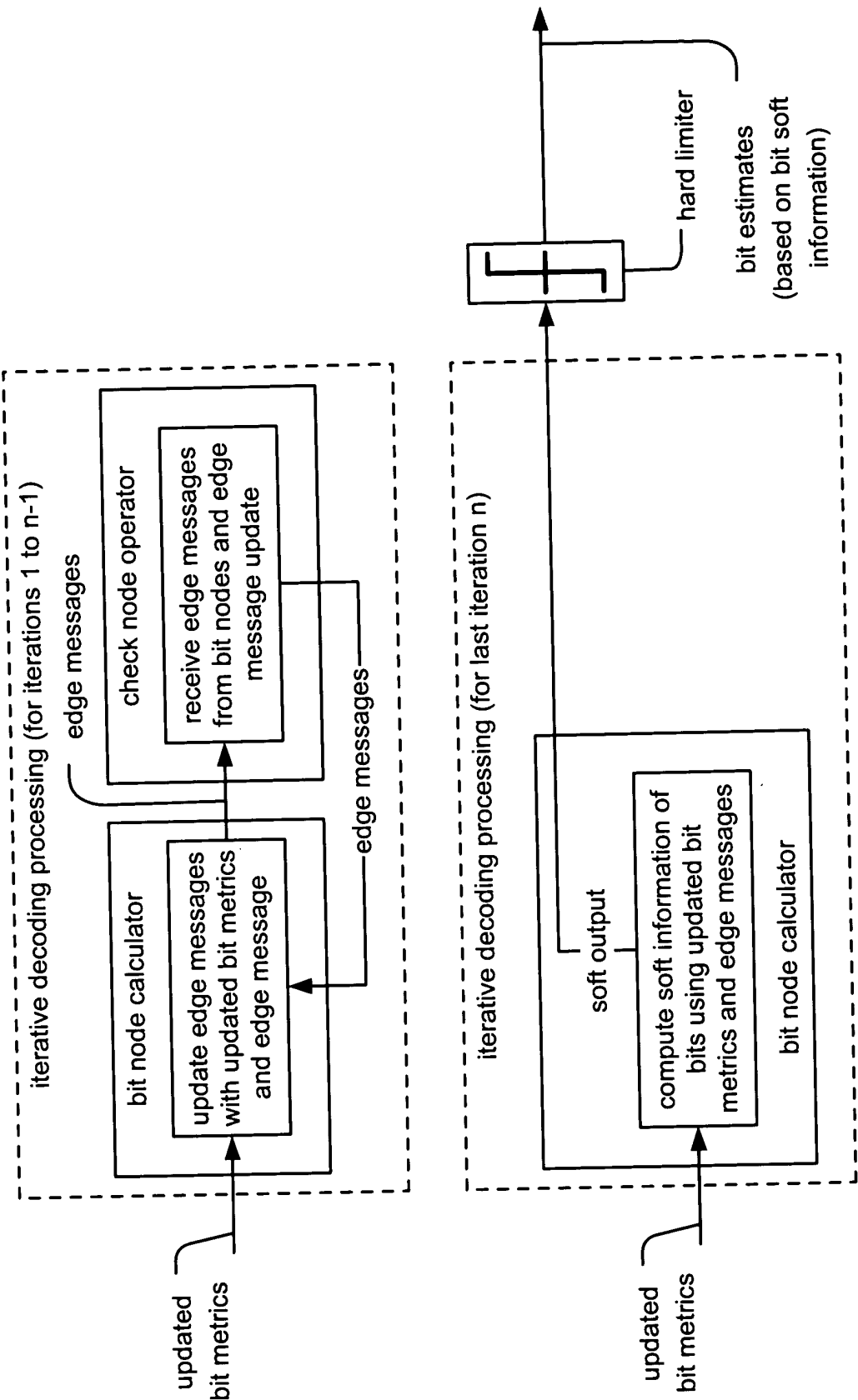


alternative LDPC coded modulation decoding functionality using bit metric (when performing n number of iterations)  
**Fig. 27**



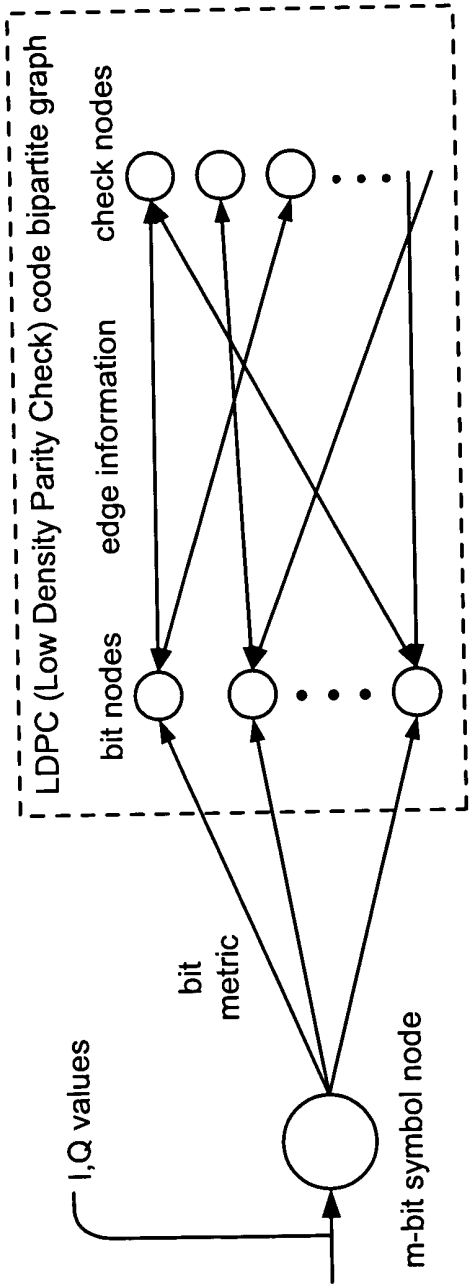
LDPC (Low Density Parity Check) coded modulation decoding functionality using bit metric (with bit metric updating)

**Fig. 28**



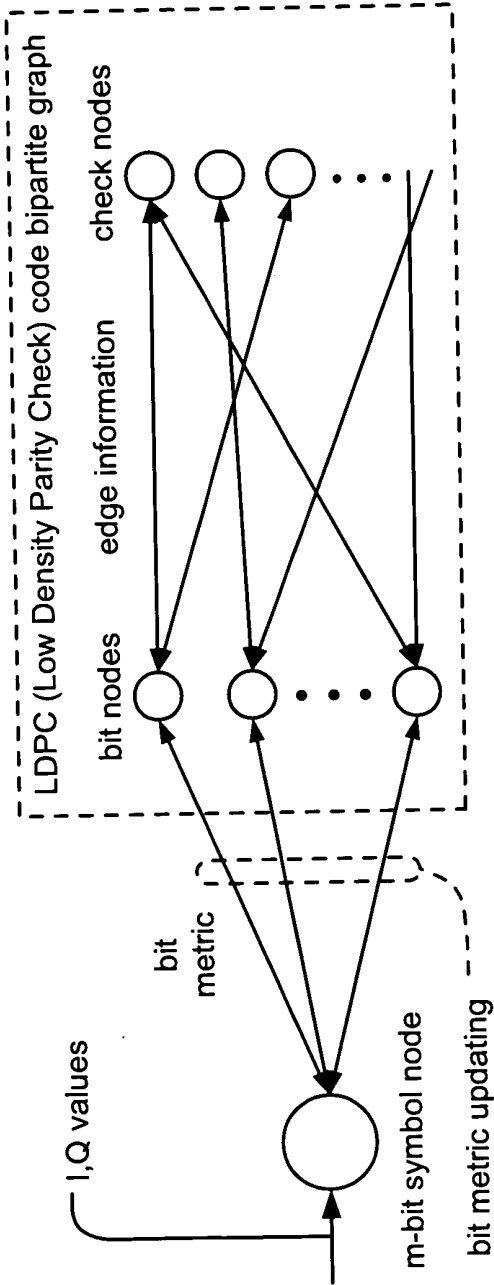
alternative LDPC coded modulation decoding functionality using bit metric (with bit metric updating) (when performing n number of iterations)

Fig. 29



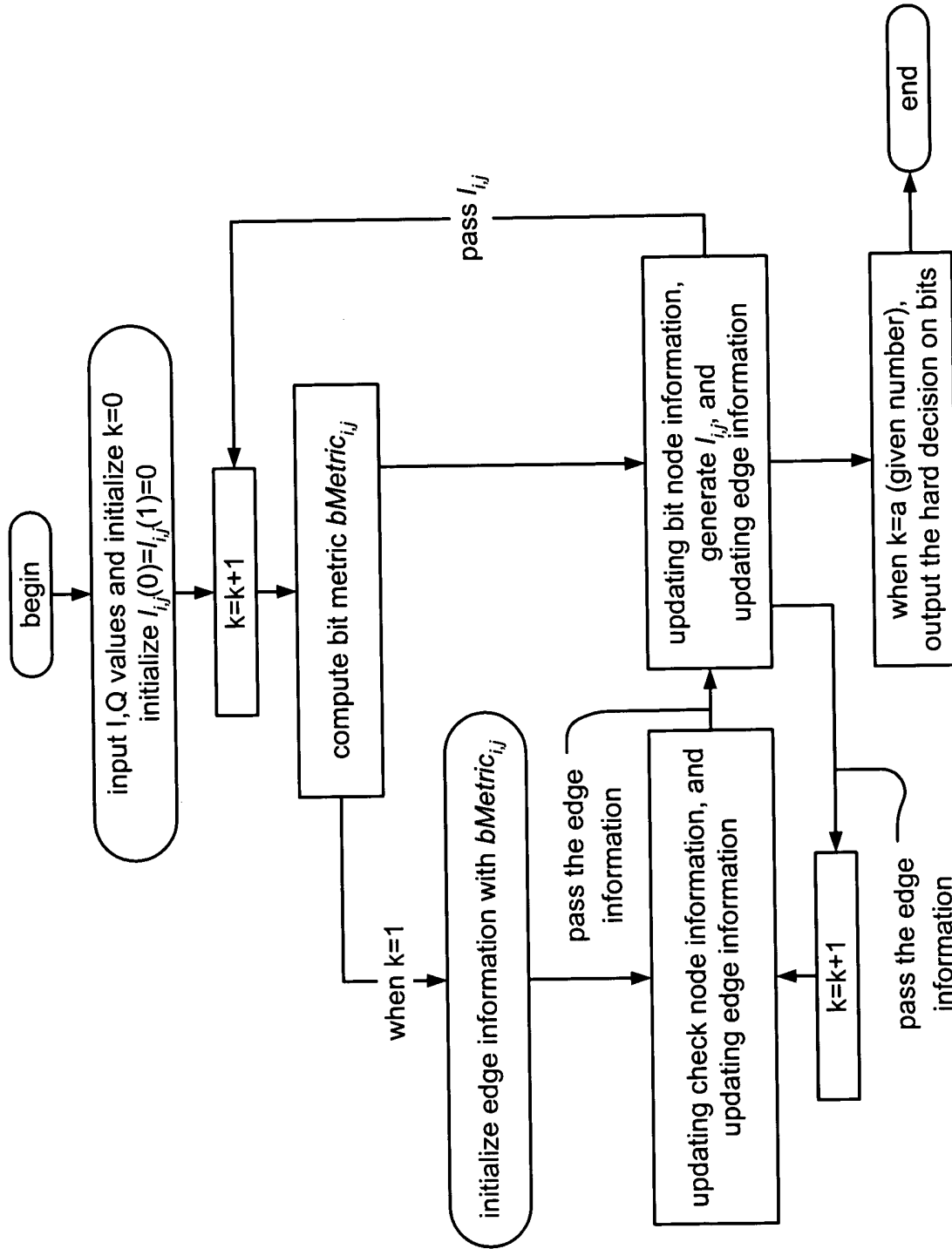
bit decoding using bit metric (shown with respect to LDPC (Low Density Parity Check) code bipartite graph)

**Fig. 30A**



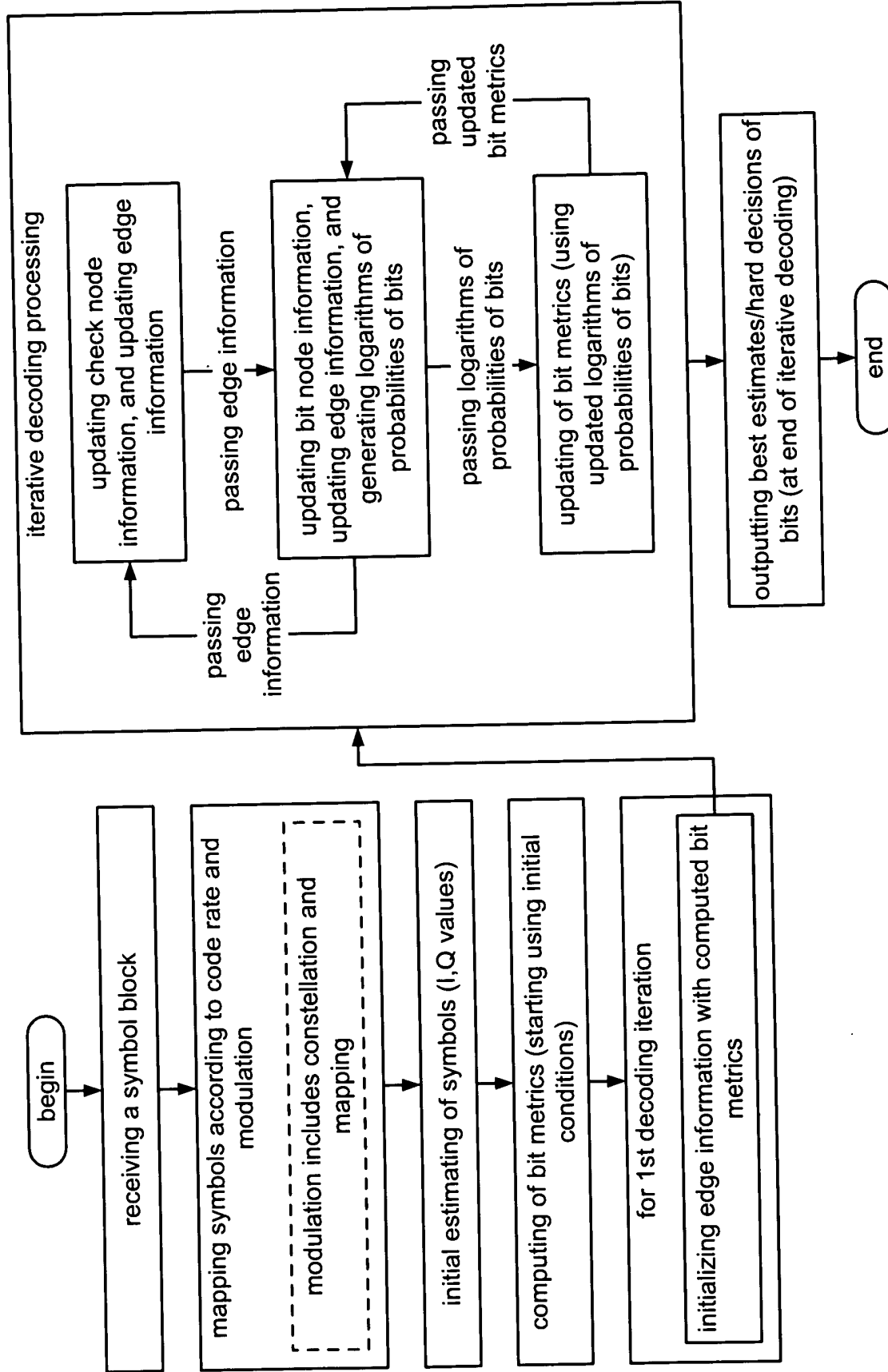
bit decoding using bit metric updating (shown with respect to LDPC (Low Density Parity Check) code bipartite graph)

**Fig. 30B**



flowchart of decoding LDPC (Low Density Parity Check) coded modulation signal with metric updating

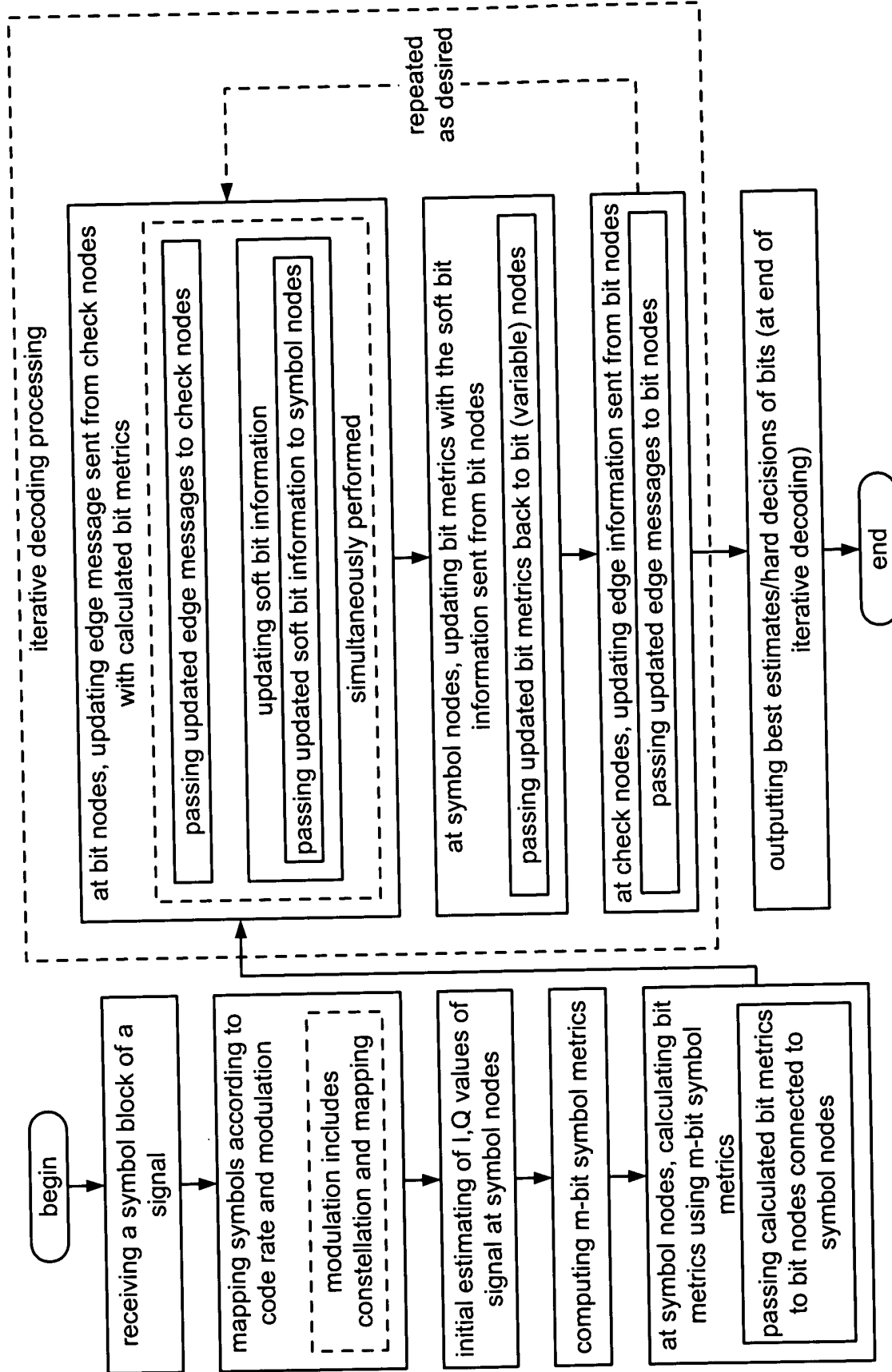
**Fig. 31**



method for decoding LDPC (Low Density Parity Check) coded modulation signal with update metric

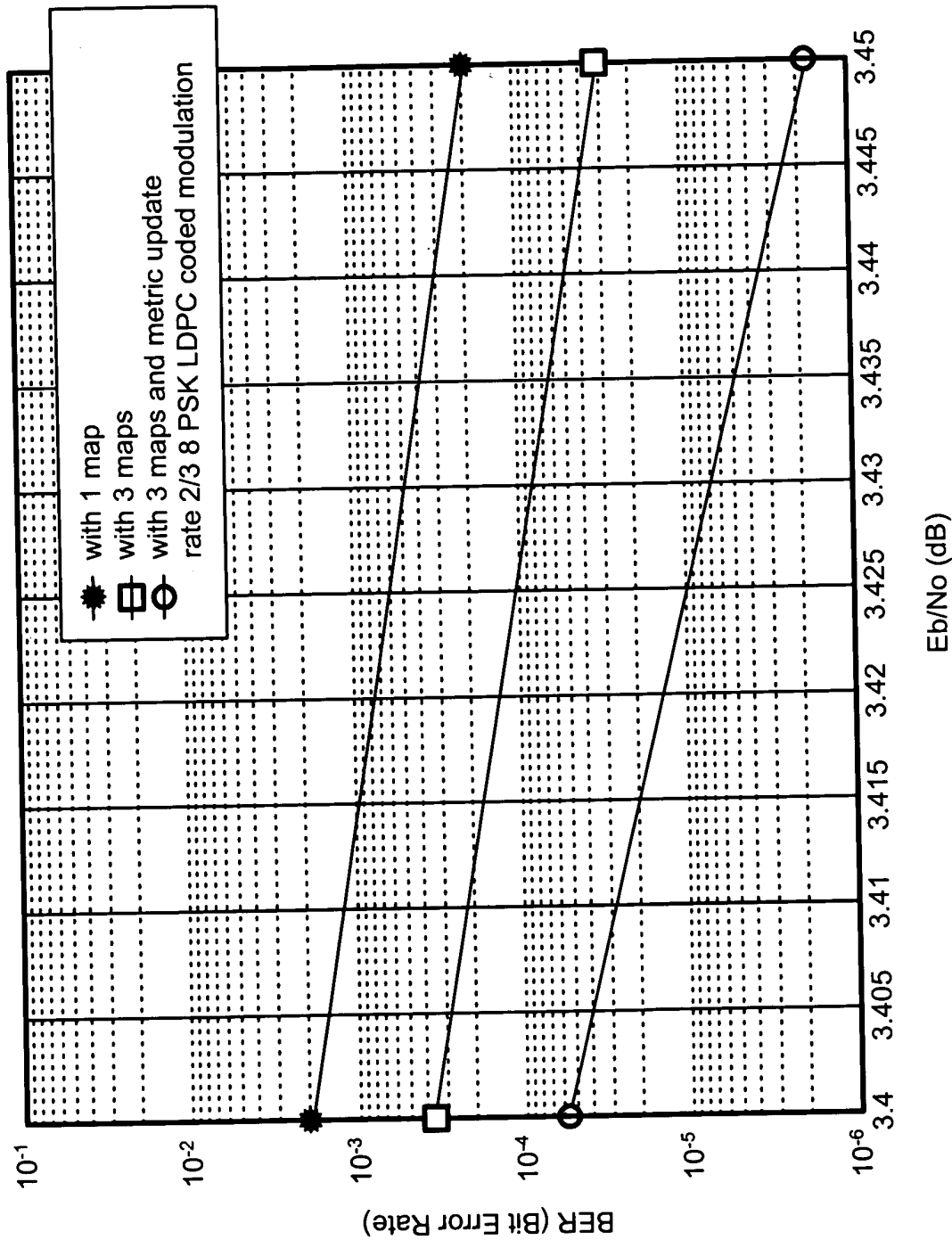
**Fig. 32**





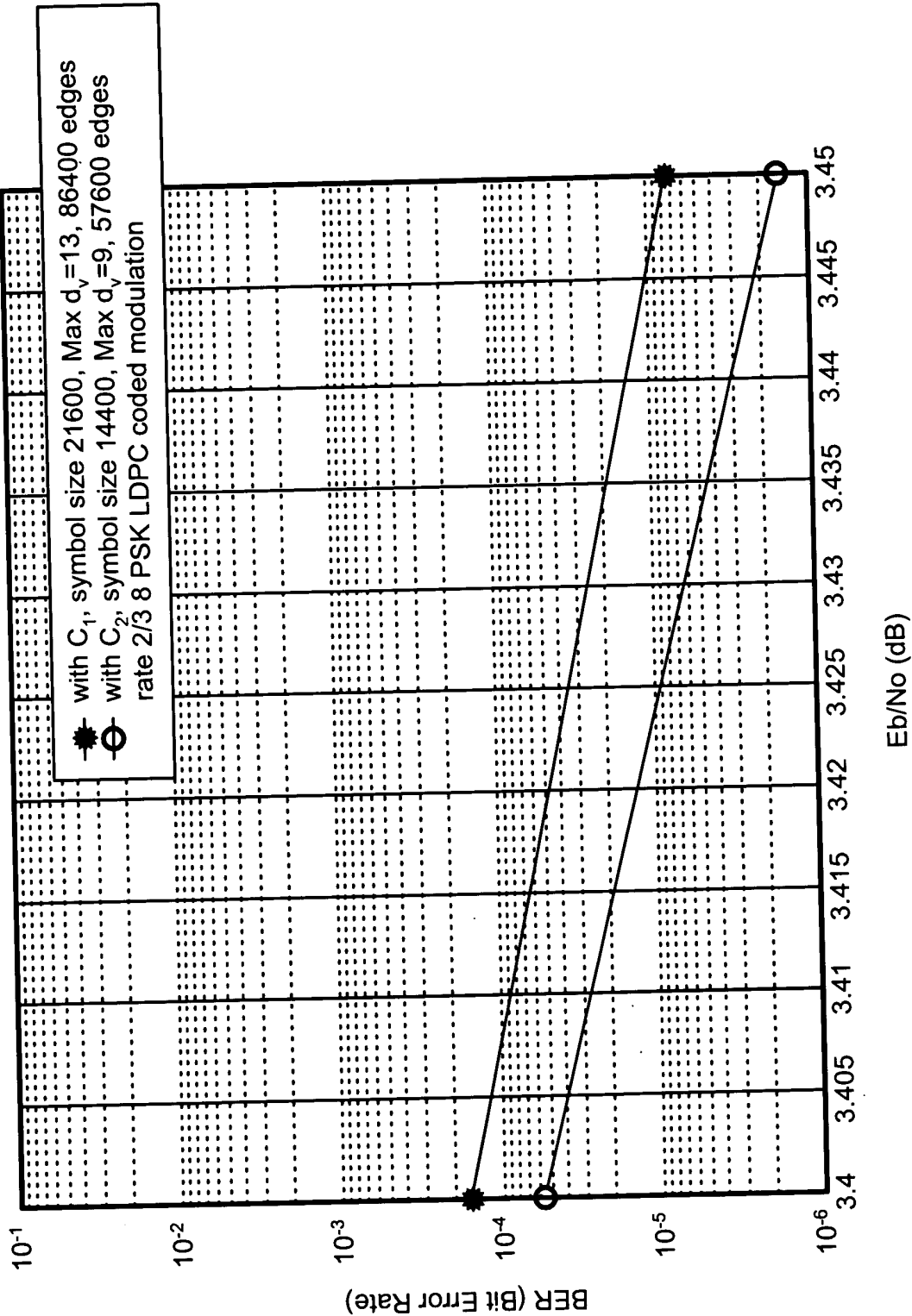
method for decoding LDPC coded modulation signal with update metric (see LDPC code bipartite graph of Fig. 26B)

**Fig. 33**



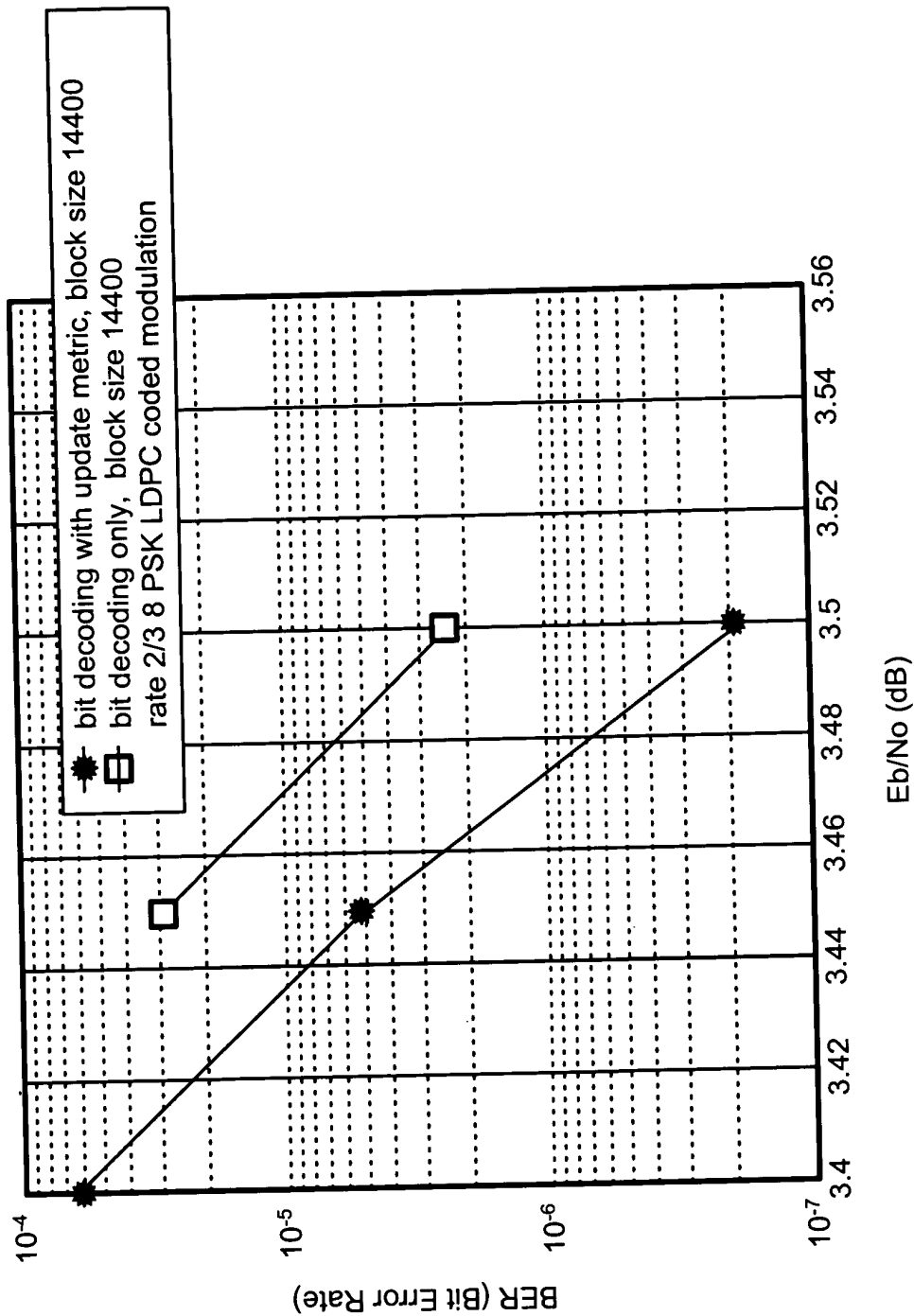
performance comparison of LDPC (Low Density Parity Check) coded modulation decoding processing for differently mapped signals (1 of which performs metric updating) (shown as using code C\_2)

Fig. 34



performance of LDPC coded modulation decoding of different symbol size  
(1. block with 21600 symbols, 3 bits per symbol and 2. block with 14400 symbols, 3 bits per symbol)

**Fig. 35**



performance comparison of bit decoding vs. bit decoding with metric updating of LDPC (Low Density Parity Check) coded modulation signals

Fig. 36